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ABSTRACT

The era of accountability in higher education is evolving into focused expectations that higher education will meet workforce needs in more direct ways than in the past. This study examined the impact universities have on the workforce in Florida using data on the baccalaureate graduating class of 1998-1999 in Florida. Records of baccalaureate graduates were matched to employer wage reports through a well established database system to determine which industries were hiring the graduates, the graduate's immediate employment status, and average earnings by major and industry. Disciplines can be targeted for further evaluation and growth by analyzing the employment outcomes of graduates. Eight appendixes provide details about employment of Florida graduates. (Contains 6 figures, 13 tables, and 11 references.) (Author/SLD)

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Determining the Impact of Universities on Workforce Development

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The era of accountability in higher education is evolving into focused expectations that higher education will meet workforce needs in more direct ways than in the past. The study examines the impact universities have on the workforce within Florida. Records of baccalaureate graduates are matched to employer wage reports through a well- established database system to determine which industries are hiring the graduates, the graduates' immediate employment status, and average earnings by major and by industry. Disciplines can be targeted for further evaluation and growth by analyzing employment outcomes of graduates.

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Determining the Impact of Universities on Workforce Development[1,2]

Introduction and Background

The era of accountability in higher education is evolving into focused expectations that higher education should meet workforce needs in more direct ways than in the past. The public, lawmakers, and the business community now look to institutions of higher education to produce graduates with the necessary knowledge and skills to be employed in high-demand occupations and in occupations which promote the economic development of the region. In the past, higher education was asked, "Are you meeting the needs of your students?" While we are still expected to respond affirmatively to this question, a second question is rising to pre-eminence "are you meeting the needs of business and industry?" Many states, for example, have targeted for development the information technology sector, and look to institutions of higher education to produce the necessary workforce.

In 1999-2000, the legislature in Florida created a Senate Select Committee on Workforce Innovation which led to passage of the Workforce Innovation Act of 2000. The Senate Select Committee engaged the State University System of Florida (SUS) in statewide discussions of workforce issues for the first time. The discussions are leading to a greater awareness of workforce needs, the role colleges and universities play in meeting those needs, and are already affecting academic planning. For example, the midcourse modification of the university system's five-year strategic plan focused on degree programs which meet needs of high-tech and information technology industries. In addition, the legislature mandated the verification, through the program review process, that program curricula are responsive to industry-driven competencies. Although universities have already identified economic development as one of the top priorities and have been working with high-tech industries to generate needed graduates

[1] The authors gratefully acknowledge the assistance provided by Amanda Brutton, Larry Gibson, and Melvin McClurkin.

[2] The views expressed in this paper are those of the authors and not necessarily those of the organizations they represent.

with the appropriate skills, the request of the Senate Committee is a sign that universities will be asked to measure and quantify their contributions.

Purpose

The study was undertaken to examine the impact of the state universities on the state's workforce using readily available data sources. In order to respond to the growing interest in meeting high-tech and high growth workforce needs, universities need to identify and target disciplines and academic programs which address those needs. It is also important to scrutinize the employment patterns of recent graduates, including wages earned. This can be accomplished by examining the main industries hiring graduates, the majors hired within the industries, and the earnings of graduates. This study examined the 1998-99 baccalaureate graduates of the SUS and their employment data during the fourth quarter of 1999 (October-December 1999, three to 12 months following graduation).

Data Sources

The study employed a well-established interagency follow-up program called the Florida Education and Training Placement Information Program (FETPIP) which is administratively housed within the Bureau of Workforce Education and Outcomes Information Services in the Florida Department of Education. The FETPIP program utilizes administrative data from the unemployment insurance (UI) wage database, federal employment databases, continuing education data at all levels, public assistance and state prison incarcerations. The UI wage file captures an estimated 96% of all employment in the state. The UI wage data does not capture those who are self-employed, work in "uncovered" employment (i.e. not covered by unemployment insurance), federal employees, those working for commission only and those in federal work-study programs. The program does capture temporary employees such as those on assistantships. FETPIP is widely used in this state to provide information for nearly all public education and training programs occurring in the State.

Graduates from the 1998-99 academic year were tracked through records provided by the interagency data collection system that contains wage information for the fourth quarter of 1999. The data collection system captures graduates who are employed within the State and reports their earnings and the types of industries in which they are employed. Employment in the fourth quarter of 1999 occurred three to six months after graduation for June 1999 graduates, and 9-12 months following graduation for those graduating in December of 1998.

Methodology

The baccalaureate graduating class of 1998-99 were identified and tracked through the interagency follow-up system for the fourth quarter of the first year following graduation (1999). Data were examined by type of industry, using the Standard Industrial Classifications (SIC) codes and by discipline, using two-digit and six-digit Classification of Instructional Programs (CIP) codes. Average fourth quarter earnings on all employed were calculated. Average "full quarter" earnings also were calculated to include only those who appear to be working full-time, full quarter (i.e. earned at least minimum wage of $5.15 x 40 hours x 13 weeks = $2,678 for the quarter). The portion of baccalaureate graduates who continue their education was noted as an indicator of a productive activity, and as an indicator that those students may not be working to full capacity, if employed.

Issues that were addressed included:

- Which majors are the highest producers of graduates?
- Which majors have the highest rate of employment in the State?
- Which majors have the highest rate of continuing education?
- Which majors show the highest average earnings immediately upon graduation?
- Which industries employed the largest number of university graduates in the State?
- What were the initial fourth quarter average earnings of graduates by discipline?
- What were the initial fourth quarter average earnings of graduates within an industry?
- Which majors produced graduates who enter high-tech industries?

- Which industries hired graduates of high tech majors?

Analyses also were performed comparing production of graduates from the university system to labor market data on distribution of the workforce among the industry sectors.

Review of Literature

The formal examination of the impact that education has on the economy dates back to the development of human capital theory. The theory examines the relationship between the level of education in the workforce and the economic strength and productivity of a country. The first study examining the economic benefits of education was undertaken in the 1960s by Denison, who used a residual approach. He attributed to education the economic growth which remained after subtracting growth due to all other factors which could be identified. Using this method Denison estimated that approximately 14% of the economic growth in the US between 1929 and 1969 could be attributed to the increased education of the workforce (Lynton, 1984). More recently, in 1983, Carnevale published data indicating that productivity increased primarily through education and working "smarter," i.e. improving processes as a result of education, training and on-the-job experience with respect to production (Lynton, 1984).

In the 1990's, a number of states, including Maryland, Texas, Illinois, Virginia, Oklahoma, Georgia, Arizona and Florida, undertook major initiatives in workforce development. While some of the undertakings included an examination of the employment of graduates within the state, Oklahoma appears to have conducted the most in-depth study by disciplines, programs within disciplines, and industry sectors. Information on the various state activities may be accessed through the State Higher Education Executive Officers website at www.sheeo.org/k16/k16-links-state-workforce.htm which provides a gateway to state workforce development websites.

Many of these initiatives were spurred by legislative interest in welfare reform and welfare-to-work programs. It was not long, however, before the concerns expanded to the contribution of higher education to the workforce, and in particular the "fit" between education and the needs of business and industry for an information-based economy.

In regard to the "fit" between education and the expectations of business and industry, several authors have examined this issue. Businesses indicate that they want employees with strong "basic skills" in mathematics and communication, and "workplace skills" in teamwork and the ability to adapt to rapid change. There has also been an interest in developing industry-driven skills standards and establishing certification programs to verify such skills (Wallhaus, 1996).

A recently published national study traces the major field of study and employment outcomes of 1992-93 baccalaureate graduates not enrolled in graduate education by 1997 (US Department of Education, 2001). The study found that graduates of applied fields such as engineering, business, computer science and health had higher than average salaries while graduates of education, social work, humanities and arts had lower than average salaries either when they were initially employed following graduation or three years later. The field of engineering stood out relative to all other majors on almost all job attributes such as earnings and benefits.

Two recent studies on the migration of students upon graduation are pertinent to the study at hand. The first, undertaken by Leadership Florida and Nova-southeastern University, focused on graduates of Florida universities. The study found that students majoring in history, social science, music, engineering and business, graduates of the research institutions and the historically Black university (HBCU) were more likely to migrate out of the state in higher

proportions than other graduates. Younger students were more likely to leave than older students, and the reason given most often for planning to leave the state was the perception that jobs with higher salaries were available elsewhere (Leadership Florida and Nova Southeastern University, 2001). The second study, by the Southern Technology Council of the Southern Growth Policies Board, had similar findings for the South as a whole. Graduates were found less likely to remain in state upon graduation if they majored in engineering or the physical sciences, had a high grade-point average, graduated from a research-intensive university, graduated from an HBCU, or were able to begin at a higher-than-average salary. The Southern Growth Policies Board study notes that while a number of states have instituted aggressive scholarship programs for in-state high school graduates, no attention has been given to "arrivers," i.e. high school graduates from out-of-state; it suggests that decreasing out-of-state tuition for arrivers in chosen majors may be a means of increasing production of graduates in targeted fields (Southern Growth Policies Board, 2001).

In Florida, the Agency for Workforce Innovation provided the following information at a meeting of the Advisory Group on Emerging Technologies held by the State University System in April 2001: Florida has the highest job growth rate in the country, at 3.7 in December 2000. In annual job growth, Florida ranked second only to California in the number of new jobs generated (262,300). The trade and services industries accounted for almost three-fourths of the new jobs. The annual job growth rate between 1998 and 2008 is projected to be 2.4%. During that time period, the professional sector is expected to generate the largest growth by occupational division, followed by the production sector. This points to the important role higher education must play in meeting the workforce needs. High-tech jobs in Florida grew at rate of 3.0 percent between 1988 and 1998. During this period, computer and engineering and

management services accounted for almost all the new high-tech jobs in Florida. High-tech manufacturing, on the other hand, posted job losses during that decade. During 1998-2008, high-tech jobs in Florida are expected to grow at a faster annual rate than jobs in non-technical industries (3.1% compared to 2.2%). Computer and engineering and management services are expected to continue to account for much of the job growth in Florida between 1998 and 2008, while high-tech manufacturing losses are expected to taper off. Projections by the Agency for Workforce Innovation indicate that the high-tech employment growth at the baccalaureate level, estimated to be 67,302, will outnumber high-tech employment growth in all other educational levels combined (i.e. less than high school, high school, post-secondary, associate's, master's, PhD and first professional). The present study therefore pays particular attention to high-tech employment at the bachelor's level.

A project of the Southern Growth Policies Board published in June 2000 found that Florida ranked sixth in the nation and first in the South in total number of employees working for high-tech firms in 1998. The average wages in Florida high-tech firms, however, were lower than the national average ($46,060 compared to $48,900). This may be one reason for the out-migration of Florida graduates in science and engineering, as implied in the Leadership Florida and Nova Southeastern study.

In 2000 the Florida legislature, in the General Appropriations Act, directed the Postsecondary Education Planning Commission to "conduct an analysis of the extent to which public and private university degree programs are providing the skilled workforce needed by Florida's economy." The study conducted by the Commission noted that Florida ranked 46th in the nation in per capita production of bachelor's degree graduates (as reported for 1996-97), that it fell below average in per capita production of baccalaureates in almost every discipline

compared to the national figures, and recommended greater coordination between higher education and business and industry to meet the State's needs for certain types of degrees (Post Secondary Planning Commission, 2000).

Results and Analysis

In 1998-99 the SUS graduated 34,057 baccalaureate students. Of these graduates, 21,680 (64%) were found employed in Florida in the fourth quarter of 1999, and 6,677 (20%), including some who were found employed, were continuing their education in public institutions within the State. 71% of the graduates were found by FETPIP to be either employed or continuing their education in Florida. The average full quarter earnings for were $7,408 for female graduates, and $8,508 for male graduates. A high percentage of the graduates were Florida residents at the time they initially enrolled (81%). Of these Florida residents, 73% were found employed or continuing their education in Florida after completing the baccalaureate degree. A majority of the graduates who were not Florida residents at the time they initially enrolled were also found employed or continuing their education in the State (61%), lending credence to the argument that out-of-state students do contribute to the state after graduation.

Analysis by Discipline and Majors

Highest producers of graduates

The programs which produced the highest number of graduates are reflected in Table 1. The table also reflects information of interest regarding the top 25 majors, such as the percent employed in Florida and the full quarter average earnings of graduates within the specified program. With the exception of psychology, which can be considered a general liberal arts degree at the bachelor's level, and English, the top 10 producers are professional programs, such as those in education, business and health. This is indicative of student interest in higher

Table 1: SUS Majors Producing the Highest Number of Baccalaureate Graduates in 1998-99 Outcomes for Fourth Quarter 1999

Rank	Major	# Grad	% All Grads	% Empl	Full Qtr Avg $	% Cont Ed	% Match
1	ELEMENTARY TEACHER ED.	2295	6.7%	75	$ 7,509	15	80
2	PSYCHOLOGY	2190	6.4%	62	$ 6,199	26	72
3	BUSINESS ADMINISTRATION & MGMT	1783	5.2%	66	$ 8,871	11	70
4	FINANCE, GEN.	1628	4.8%	64	$ 8,097	11	69
5	CRIMINAL JUSTICE STUDIES	1399	4.1%	70	$ 7,226	22	78
6	ACCOUNTING	1338	3.9%	71	$ 8,602	36	81
7	NURSING (R.N.)	1126	3.3%	80	$ 9,954	16	84
8	ENGLISH LANGUAGE & LIT.	1023	3.0%	56	$ 6,643	24	66
9	MARKETING	1002	2.9%	68	$ 8,006	10	70
10	COMMUNICATIONS	989	2.9%	66	$ 6,804	13	70
11	POLITICAL SCIENCE	749	2.2%	53	$ 7,478	24	63
12	BIOLOGY	726	2.1%	48	$ 6,372	23	58
13	COMPUTER & INFORMATION SCIENCE	664	1.9%	63	$ 10,722	13	68
14	SOCIAL WORK	587	1.7%	72	$ 6,702	41	85
15	PHYS ED. TEACHING & COACHING	523	1.5%	62	$ 6,682	21	69
16	HISTORY	480	1.4%	57	$ 6,731	26	67
17	SOCIOLOGY	477	1.4%	66	$ 6,976	21	72
18	SPEECH-LANG PATH & AUDIOGRAPHY	454	1.3%	60	$ 5,850	41	76
19	ELECTRICAL ENGINEERING	439	1.3%	50	$ 11,151	26	62
20	MGMT. SCIENCE	428	1.3%	63	$ 10,129	10	67
21	SOCIAL SCIENCES, GEN.	418	1.2%	67	$ 6,995	26	77
22	LIBERAL ARTS AND SCIENCES	411	1.2%	67	$ 7,317	19	75
23	BUSINESS, GENERAL	367	1.1%	77	$ 8,043	13	80
24	HOSPITALITY ADMIN MANAGEMENT	366	1.1%	58	$ 6,646	7	61
25	CIVIL ENGINEERING	352	1.0%	67	$ 10,098	24	80
	Sum	22214	65%				
	Total All Baccalaureate Graduates	34057					

Source: FETPIP Followup of 1998-99 SUS Graduates for 4th Quarter 1999

education as a means of entry into a specific profession rather than a general liberal arts education which dominated the higher education landscape in the early part of the twentieth-century. Some traditional liberal arts and social sciences disciplines such as psychology, English, political science and history, however, still have considerable appeal among students. Only one basic science program, computer science, and two engineering programs fell within the top 25 producers. While there is considerable interest in Florida in promoting high-tech industry, students are not entering these fields at the same rate as professional fields in education, business and health. This finding is similar to that at the national level as discussed in a recently published study by the US Department of Education (2001). The national study examined 1992-

93 baccalaureate recipients not enrolled in graduate education by 1997, and found that the discipline with the largest number of graduates was business (28%), while 7% of the graduates majored in engineering and architecture, 4% in biological/interdisciplinary sciences, 3% in computer science, and 2% in mathematics and physical sciences. The SUS of Florida had identical percentages of graduates in the engineering and science fields, but slightly less (21%) in business.

High rates of employment within the State

Graduates of some degree programs tend to remain and become employed in Florida at higher rates than others. Table 2 lists the top 25 programs, which had at least 25 graduates, with the highest rate of employment in Florida.

Table 2: SUS Majors Producing the Highest Percent of 1998-99 Baccalaureate Graduates Found Employed In Florida Outcomes for Fourth Quarter 1999

Rank	Major	# Grad	% Empl	Full Qtr Avg $	% Cont Ed
1	BUSINESS TEACHER ED	27	96	$ 8,130	37
2	ED. OF THE EMOTIONAL HANDICAPPED	105	94	$ 8,366	20
3	MEDICAL TECHNOLOGY	63	87	$ 8,806	6
4	ED. OF SPEACH LEARN DISABLED	167	83	$ 8,127	20
5	ED OF THE MENTALLY HANDICAPPED	48	81	$ 8,166	23
6	NURSING (R.N. TRAINING)	1126	80	$ 9,954	16
7	ENGLISH TEACHER ED.	158	80	$ 7,743	13
8	MEDICAL RECORDS ADMINISTRATION	88	80	$ 7,445	11
9	PUBLIC ADMINISTRATION	103	78	$ 9,760	13
10	ART TEACHER ED.	37	78	$ 7,920	11
11	SOCIAL PSYCHOLOGY	27	78	$ 7,156	22
12	BUSINESS, GENERAL	367	77	$ 8,043	13
13	RESPIRATORY THERAPY TECH.	69	77	$ 8,317	28
14	CONSTRUCTION/ BUILDING TECH.	192	76	$ 10,631	7
15	ELEMENTARY TEACHER ED.	2295	75	$ 7,509	15
16	SCIENCE TEACHER ED.	57	75	$ 7,846	9
17	ELECTRICAL ENGINEERING TECH	51	75	$ 10,730	14
18	HEALTH CARE ADMINISTRATION	300	74	$ 7,537	20
19	HEALTH SCIENCE	254	73	$ 7,368	31
20	INDIV. & FAMILY DEVELOPMENT	132	73	$ 5,716	22
21	GERONTOLOGY	37	73	$ 7,077	30
22	SOCIAL WORK	587	72	$ 6,702	41
23	ACCOUNTING	1338	71	$ 8,602	36
24	SOCIAL SCIENCE TEACHER ED.	137	71	$ 7,692	15
25	INFORMATION SCIENCES & SYSTEMS	132	71	$ 10,016	11
	Sum Top 25 w/ minimum of 25 grads	7897			
	Total All Baccalaureate Graduates	34057			
	Total Minimum of 25 Grads	33439			

Source: FETPIP Follow-up of 1998-99 Baccaleaurate Graduates for 4th Quarter 1999

Education programs dominate this list, with nine of the top 25 programs in this category. If one examines the programs with at least 25 graduates in which 70% or higher are found employed in the State, education, health, business, social work and public administration are the disciplines which emerge. Only two engineering technology programs, i.e. construction/building technology and electrical engineering technology, had high rates of graduates being employed in the state (76% and 75% respectively). None of the baccalaureate level professional engineering programs had as high rates of employment in the State.

Low employment within the State

The lowest rates of employment in the State were posted by the programs which appear in Table 3. Only programs with 25 or more graduates were listed on the table.

Table 3: SUS Majors Producing the Lowest Percent of 1998-99 Baccalaureate Graduates Found Employed In Florida Outcomes for Fourth Quarter 1999

Rank	Major	# Grad	% Empl	Full Qtr Avg $	% Cont Ed
95	ECONOMICS	242	50	$ 7,764	19
96	ANTHROPOLOGY	193	50	$ 5,450	24
97	CHEMISTRY	185	50	$ 7,248	25
98	MATHEMATICS	175	50	$ 7,517	27
99	ARCHITECTURE	138	50	$ 8,639	25
100	INDUSTRIAL/MANUFACTURING ENGIN	86	50	$ 10,362	15
101	GERMAN LANGUAGE	26	50	$ 7,367	46
102	BIOLOGY	726	48	$ 6,372	23
103	DRAMA/THEATER ARTS	195	47	$ 5,803	8
104	BIOLOGICAL & PHYSICAL SCIENCES	99	47	$ 6,820	26
105	ZOOLOGY	96	44	$ 5,972	35
106	FOOD SCIENCES & TECH	157	43	$ 6,011	31
107	CLASSICS/CLASSICAL LANG	30	43	$ 4,877	27
108	MICROBIOLOGY	269	42	$ 6,141	34
109	PHILOSOPHY	83	41	$ 5,712	28
110	GRAPHIC DESIGN, COMMERCIAL ART	49	41	$ 6,811	0
111	FRENCH LANGUAGE	46	39	$ 6,090	35
112	CHEMICAL ENGINEERING	162	36	$ 11,536	19
113	MUSIC - GEN. PERFORMANCE	59	36	$ 7,326	25
114	PHYSICS	47	36	$ 7,462	38
115	FILM / CINEMA STUDIES	26	35	$ 5,442	4
116	MATERIALS ENGINEERING	25	32	$ 9,612	24
117	INDEPEND/INTERDISC STUDIES	67	31	$ 7,070	33
118	MUSIC, GENERAL	73	30	$ 6,605	34
119	NEW COLLEGE / HONORS COLLEGE	137	29	$ 5,598	13
	Sum Lowest 25 w/ minimum of 25 grads	3391			
	Total All Baccalaureate Graduates	34057			
	Total Minimum of 25 Grads	33439			

Source: FETPIP Follow-up of 1998-99 Baccaleaurate Graduates for 4th Quarter 1999

The baccalaureate level professional engineering programs which were conspicuous by their absence on the list of programs with high rates of employment in the state were represented instead on the list of programs with the lowest rates of employment in the state, as were several science programs. A number of smaller engineering and science programs with less than 25 graduates, such as ocean engineering, and atmospheric sciences, also have low rates of employment within the State. In the case of the science programs, anecdotal information suggests that many students may be leaving the state to pursue graduate education. A few

science and engineering programs have high rates of continuing education in the State, but, as indicated in a later section of this paper, several science and engineering programs have low percentages of students found either employed or continuing education within the state

Continuing education

Employment within the State is only one avenue by which graduates remain in the State; the other main avenue is through continuation of their education. The FETPIP database is able to track students who continue their education at any of the state's public institutions and many of the private universities in the Florida Resident Access Grant (FRAG). The top 25 programs, with a minimum of 25 graduates, with the highest rate of students found continuing their education in Florida appear in Table 4.

Not surprisingly, some professional programs where entry into the profession is at the master's or doctoral level have high rates of continuing education; e.g. speech-language pathology and audiology, social work, and public administration. Accounting, another program with a relatively high percent of graduates continuing their education, requires coursework beyond the baccalaureate to be eligible for certification. The science disciplines, where careers are generally built upon graduate level education, also have high rates of continuing education. In the case of physics, zoology and geology, graduates appear to be continuing their education in Florida at higher rates than in other science disciplines (38%, 35% and 35% respectively, compared to 23% in biology and 25% in chemistry). Psychology, which is the second highest-producing program in the State, has a relatively high rate of continuing education at 26%. FETPIP is currently in the process of collecting out-of-state continuing education data via the "Ed Evaluator" program managed by the National Student Clearinghouse. Results on those found continuing their education out-of-state will be reviewed in the near future.

Programs, with at least 25 graduates, which have the lowest percent of graduates found continuing their education in Florida are predominantly those in which there is a high market demand for baccalaureate graduates, such as management information systems, interior design, several health programs and education programs.

Table 4: SUS Majors Producing the Highest Percent of 1998-99 Baccalaureate Graduates Found Continuing Education In Florida Outcomes for Fourth Quarter 1999

Rank	CIPTITLE	# Grad	% Empl	FQ Avg $	% Cont Ed	% Cont Ed and Empl	% Cont Ed Not Empl
1	GERMAN LANGUAGE	26	50	$ 7,367	46	23	23
2	SOCIAL WORK	587	72	$ 6,702	41	28	13
3	SPEECH-LANG PATH & AUDIO	454	60	$ 5,850	41	24	16
4	SPANISH LANGUAGE	117	56	$ 6,896	40	23	17
5	ANIMAL SCIENCES	100	58	$ 5,990	40	19	21
6	ART HISTORY	33	55	$ 4,830	39	27	12
7	PHYSICS, GEN.	47	36	$ 7,462	38	11	28
8	BUSINESS TEACHER ED	27	96	$ 8,130	37	37	0
9	ACCOUNTING	1338	71	$ 8,602	36	26	10
10	ZOOLOGY, GEN.	96	44	$ 5,972	35	10	25
11	GEOLOGY	52	52	$ 8,390	35	15	19
12	FRENCH LANGUAGE	46	39	$ 6,690	35	13	22
13	DESIGN IN ARCH STUDIES	34	62	$ 8,103	35	26	9
14	MICROBIOLOGY	269	42	$ 6,141	34	10	23
15	MUSIC, GEN.	73	30	$ 6,605	34	8	26
16	PUBLIC ADMINISTRATION	103	78	$ 9,760	33	26	7
17	INDEPEND/INTERDISC STUDIES	67	31	$ 7,070	33	7	25
18	HEALTH SCIENCE	254	73	$ 7,368	31	22	9
19	FOOD SCIENCES & TECH	157	43	$ 6,011	31	15	15
20	HEALTH TEACHER ED.	150	67	$ 6,727	31	23	8
21	GERONTOLOGY	37	73	$ 7,077	30	24	5
22	SPECIAL ED., GEN.	339	66	$ 6,811	28	17	11
23	PHILOSOPHY	83	41	$ 5,712	28	14	13
24	RESPIRATORY THERAPY TECH.	69	77	$ 8,317	28	25	3
25	MATHEMATICS	175	50	$ 7,517	27	14	14
	Sum Top 25 w/ minimum of 25 grads	4733					
	Total All Baccalaureate Graduates	34057					
	Total Minimum of 25 Grads	33439					

Source: FETPIP Follow-up of 1998-99 Baccaleaurate Graduates for 4th Quarter 1999

Graduates Found within the State

The graduates found within the state include those employed, those continuing their education, those employed by the federal government, and others who may be included in other databases used by FETPIP such as those receiving public assistance or who are incarcerated. The vast majority of graduates "found" were those employed or continuing their education. Table 5 displays the top 25 programs, with a minimum of 25 graduates, by percent of graduates "found" in the State, using an unduplicated headcount.

Table 5: SUS Majors Producing the Highest Percent of 1998-99 Baccalaureate Graduates Found (% Match) In Florida Outcomes for Fourth Quarter 1999

Rank	CIPTITLE	# Grad	% Empl	FQ Avg $	% Cont Ed	% Found
1	BUSINESS TEACHER ED	27	96	$ 8,130	37	96
2	ED. OF THE EMOTIONAL HANDICAP.	105	94	$ 8,366	20	95
3	MEDICAL TECHNOLOGY	63	87	$ 8,806	6	87
4	PUBLIC ADMINISTRATION	103	78	$ 9,760	33	86
5	ED. OF SPEACH LEARN DISABLED	167	83	$ 8,127	20	86
6	SOCIAL WORK	587	72	$ 6,702	41	85
7	ED OF THE MENTALLY HANDICAPPED	48	81	$ 8,166	23	85
8	MEDICAL RECORDS ADMINISTRATION	88	80	$ 7,445	11	85
9	NURSING (R.N. TRAINING)	1126	80	$ 9,954	16	84
10	ENGLISH TEACHER ED.	158	80	$ 7,743	13	84
11	HEALTH SCIENCE	254	73	$ 7,368	31	83
12	AGRICULTURAL ENGIN.	42	67	$ 8,369	26	83
13	ACCOUNTING	1338	71	$ 8,602	36	81
14	SOCIAL PSYCHOLOGY	27	78	$ 7,156	22	81
15	ART TEACHER ED.	37	78	$ 7,920	11	81
16	RESPIRATORY THERAPY	69	77	$ 8,317	28	80
17	CIVIL ENGIN., GEN.	352	67	$ 10,098	24	80
18	ELEMENTARY TEACHER ED.	2295	75	$ 7,509	15	80
19	BUSINESS, GEN.	367	77	$ 8,043	13	80
20	ANIMAL SCIENCES, GEN.	100	58	$ 5,990	40	79
21	HEALTH CARE ADMINISTRATION	300	74	$ 7,537	20	79
22	GERONTOLOGY	37	73	$ 7,077	30	78
23	SPECIAL ED., GEN.	339	66	$ 6,811	28	78
24	CRIMINAL JUSTICE STUDIES	1399	70	$ 7,226	22	78
25	INDIV. & FAM DEVEL STUDIES	132	73	$ 5,716	22	78
	Sum Top 25 w/ minimum of 25 grads	9560				
	Total All Baccalaureate Graduates	34057				
	Total Minimum of 25 Grads	33439				

Source: FETPIP Follow-up of 1998-99 Baccaleaurate Graduates for 4th Quarter 1999

The programs with high "found" rates were professional programs including education, public administration, criminal justice, social work and business.

Table 6 displays the 25 programs, with a minimum of 25 graduates, which had the lowest percent of graduates found in the State.

Table 6: SUS Majors Producing the Lowest Percent of 1998-99 Baccalaureate Graduates Found (% Match) In Florida Outcomes for Fourth Quarter 1999

Rank	CIPTITLE	# Grad	% Empl	EQ Avg $	% Cont Ed	% Found
95	FOOD SCIENCES & TECH	157	43	$ 6,011	31	61
96	JOURNALISM	156	53	$ 6,585	13	61
97	MUSIC TEACHER ED.	92	57	$ 8,421	13	61
98	HOSPITALITY ADMINISTRATION	366	58	$ 6,646	7	61
99	ECONOMICS, GEN.	242	50	$ 7,764	19	60
100	MECHANICAL ENGINEERING	329	53	$ 11,510	15	60
101	MAGAZINE PRODUCTION	35	51	$ 6,753	14	60
102	SYSTEMS ENGINEERING	98	57	$ 10,348	13	60
103	MGMT. INFORMATION SYSTEMS	83	58	$ 9,744	1	59
104	BIOLOGY	726	48	$ 6,372	23	58
105	STUDIO / FINE ART	223	52	$ 6,144	14	58
106	INDEPEND/INTERDISC STUDIES	67	31	$ 7,070	33	57
107	CLASSICS/CLASSICAL LANG	30	43	$ 4,877	27	57
108	MUSIC, GENERAL	73	30	$ 6,605	34	56
109	DANCE	41	51	$ 6,197	10	56
110	FILM - VIDEO MAKING	27	56	$ 4,919	0	56
111	INDUSTRIAL/MANUFACTURING ENGIN	86	50	$ 10,362	15	55
112	PHILOSOPHY	83	41	$ 5,712	28	54
113	MATERIALS ENGIN.	25	32	$ 9,612	24	52
114	MUSIC - GEN. PERFORMANCE	59	36	$ 7,326	25	51
115	DRAMA/THEATER ARTS, GEN.	195	47	$ 5,803	8	51
116	CHEMICAL ENGIN.	162	36	$ 11,536	19	45
117	GRAPHIC DESIGN, COMMERCIAL ART	49	41	$ 6,811	0	41
118	NEW COLLEGE	137	29	$ 5,598	13	39
119	FILM / CINEMA STUDIES	26	35	$ 5,442	4	38
	Sum Lowest 25 w/ minimum of 25 grads	3567				
	Total All Baccalaureate Graduates	34057				
	Total Minimum of 25 Grads	33439				

Source: FETPIP Follow-up of 1998-99 Baccaleaurate Graduates for 4th Quarter 1999

It is notable that some of the programs with the lowest percent found are in the sciences and engineering. This high exodus of graduates from the science and engineering fields should be a cause for concern as the State attempts to expand its high-tech industry sector. Several of the

performing arts, such as general music, music performance, film and drama, also appear on the list with low rates of employment in the State, while the entertainment sector plays a major role in the State's economy in light of the importance of tourism, graduates of the performing arts apparently do not find attractive opportunities in the State. Alternately, some may not be captured by the databases utilized by FETPIP if they are self-employed. Anecdotal information suggests that graduates are moving out of state to cities with well-developed arts sectors. Journalism and Magazine production graduates may have left the State in search of employment opportunities in states with larger publication industries.

Majors with highest average earnings upon graduation

Earnings of graduates utilized in the study were "full quarter earnings"; i.e. earnings which are considered to be for the full quarter because the amount exceeds the minimum one would earn on minimum wage if one worked for the entire fourth quarter ($2, 678). It is possible that some part-time earnings are high enough that they meet this threshold and are counted as full quarter earnings, thus artificially lowering the average. The top 25 majors, with at least 10 graduates, which produced the graduates with the highest average earnings appear in Table 7. A minimum of ten graduates was stipulated so that very small numbers which may be skewed by an anomalous salary, were avoided. The minimum was not set higher because data on some relatively small majors of interest would have been lost.

Unexpectedly, graduates of the surveying program earned the highest salaries. Engineering and engineering technology majors dominated the top ten majors by earnings, with seven of the highest earning majors. Among the top 25 majors, almost half (12) were in Engineering. Other disciplines with two or more degree programs in the top 25 average earners were business (four majors) and health (two). All of the information technology programs in the

SUS (computer science, computer engineering, information sciences and systems, and management information systems), with the one exception of Information Studies which was established fairly recently, were included in the top 25 earning programs. Interestingly, public administration graduates out-earned some of the engineering and business graduates. Landscape architecture was in the top 25 programs, while architecture was not, perhaps because some of the architecture programs in the state prepare for licensure at the master's level while the baccalaureate programs provide preparatory work.

Table 7: SUS Majors Producing the Highest 1999 Fourth-Quarter / Full-Quarter Earnings 1998-99 Baccalaureate Graduate Outcomes for Fourth Quarter 1999

Rank	CIPTITLE	# Grad	% Empl	FQ Avg $	% Cont Ed
1	SURVEYING	17	76	$ 11,865	12
2	ENGINEERING TECH	17	53	$ 11,770	18
3	MECHANICAL ENGINEERING TECH	16	50	$ 11,708	25
4	COMPUTER ENGIN.	294	62	$ 11,562	18
5	CHEMICAL ENGIN.	162	36	$ 11,536	19
6	MECHANICAL ENGIN.	329	53	$ 11,510	15
7	ELECTRICAL ENGINEERING	439	50	$ 11,151	26
8	ELECTRICAL ENGINEERING TECH	51	75	$ 10,730	14
9	COMPUTER & INFORMATION SCI	664	63	$ 10,722	13
10	CONSTRUCTION / BUILDING TECH	192	76	$ 10,631	7
11	INDUSTRIAL/MANUFACTURING ENGIN	86	50	$ 10,362	15
12	SYSTEMS ENGIN.	98	57	$ 10,348	13
13	TRANSPORTATION MGMT	12	92	$ 10,244	0
14	BUSINESS MANAGEMENT	428	63	$ 10,129	10
15	CIVIL ENGININEERING	352	67	$ 10,098	24
16	INFORMATION SCIENCES & SYSTEMS	132	71	$ 10,016	11
17	NURSING (R.N. TRAINING)	1126	80	$ 9,954	16
18	PUBLIC ADMINISTRATION	103	78	$ 9,760	33
19	MGMT. INF. SYSTEMS	83	58	$ 9,744	1
20	TRADE & INDUST TEACH ED	21	62	$ 9,647	33
21	INSURANCE AND RISK MGMT.	21	81	$ 9,634	5
22	MATERIALS ENGIN.	25	32	$ 9,612	24
23	LANDSCAPE ARCHITECTURE	22	50	$ 9,526	5
24	ENGINEERING SCIENCE	24	50	$ 9,434	50
25	MED RADIOLOGIC TECH	17	76	$ 9,288	6
	Sum Top 25 w/ minimum of 10 grads	4731			
	Total All Baccalaureate Graduates	34057			
	Total Minimum of 10 Grads	33925			

Source: FETPIP Follow-up of 1998-99 Baccalaaurate Graduates for 4th Quarter 1999

The visual and performing arts discipline, which tended to have low wages, had three exceptions with moderate to high wages: interior design ($7,700), music performance ($7,326) and jazz studies ($ 9,254).

Florida, like all other states, is interested in producing large numbers of graduates who earn high salaries. It is therefore encouraging that five of the top 25 programs (20%) in terms of the earnings were also among the top 25 producers of graduates. These high producing, high earning programs were nursing, computer and information sciences, electrical engineering, management science and civil engineering.

Looking at average full quarter earnings at the program level, one finds the following distribution of programs with average earnings falling within the specified ranges, and the total number of graduates associated with those programs.

Average Quaterly Earnings Range	Majors&Graduate within the Major
$2,678- $5,999	25 majors with 2,010 grads
$6,000-$6,999	49 majors with 12,103 grads
$7,000-$7,999	31 majors with 7,532 grads
$8,000-$8,999	25 majors with 7,579 grads
$9,000-$9,999	13 majors with 1,479 grads
$10,000 up	16 majors with 3,289 grads

The range which captures the programs with the largest number of graduates is $6,000 to $6,999. However, the combined total of graduates in programs between $7,000 and $8,999 (15,111) exceeds the total below $7,000 (14,113). It is also encouraging that the graduates in majors with an average of $10,000 or more in earnings spikes up to 3,289 graduates in 16 majors.

Majors with lowest average earnings upon graduation

Among the lowest-earning 25 majors, with at least 10 graduates, four were in the sciences. While this was a surprising finding, perhaps it is due to the fact that some may have been employed as graduate assistants, and the norm for entry into the field as a scientist is at the graduate level. Three of the programs were in agriculture and natural resources. In spite of the emerging film industry in Florida, and two highly regarded film programs within the SUS, radio and television broadcasting, film and film-video were also in the bottom 25 majors in terms of earnings.

Table 8: SUS Majors Producing the Lowest
1999 Fourth-Quarter / Full-Quarter Earnings
1998-99 Baccalaureate Graduate Outcomes for Fourth Quarter 1999

Rank	CIPTITLE	# Grad	% Empl	FQ Avg $	% Cont Ed
95	MICROBIOLOGY/BACTERIOLOGY	269	42	$ 6,141	34
96	FRENCH LANGUAGE	46	39	$ 6,098	35
97	FOREST RES & CONSERVATION	108	57	$ 6,050	20
98	FOOD SCIENCES & TECH	157	43	$ 6,011	31
99	ANIMAL SCIENCES	100	58	$ 5,990	40
100	ZOOLOGY	98	44	$ 5,972	35
101	MIDDLE SCHOOL TEACHING	18	83	$ 5,965	6
102	ENTOMOLOGY	22	45	$ 5,941	27
103	RADIO & TELEVISION BROADCAST	260	64	$ 5,851	10
104	SPEECH-LANG PATH & AUDIOLOGY	454	60	$ 5,850	41
105	DRAMA/THEATER ARTS	195	47	$ 5,803	8
106	WOMEN'S STUDIES	19	68	$ 5,729	32
107	INDIV. & FAM DEVEL STUDIES	132	73	$ 5,716	22
108	PHILOSOPHY	83	41	$ 5,712	28
109	VOCATIONAL REHAB COUNSELING	32	69	$ 5,648	19
110	NEW COLLEGE	137	29	$ 5,598	13
111	ANTHROPOLOGY	193	50	$ 5,450	24
112	FILM/CINEMA STUDIES	26	35	$ 5,442	4
113	HUMANITIES	81	62	$ 5,331	25
114	FILM - VIDEO MAKING	27	56	$ 4,919	0
115	CHEMICAL SCIENCES	11	27	$ 4,881	18
116	CLASSICS/CLASSICAL LANG	30	43	$ 4,877	27
117	ART HISTORY	33	55	$ 4,830	39
118	MARINE/AQUATIC BIOLOGY	16	44	$ 4,719	44
119	EAST ASIAN LANGUAGE	17	53	$ 4,125	24
	Sum Lowest 25 w/ minimum of 10 grads	2562			
	Total All Baccalaureate Graduates	34057			
	Total Minimum of 10 Grads	33925			

Source: FETPIP Follow-up of 1998-99 Baccaleaurate Graduates for 4th Quarter 1999

The two film programs had a very low percentage of graduates found in the state; perhaps a reflection of better opportunities elsewhere, and the difficulties in breaking into the industry as a new graduate.

While the business discipline tended to have high wages, four programs had average wages in the $6,000 to $7,000 range: business economics, financial services, hospitality management, and real estate.

Earnings and continuing education

Several disciplines and programs with relatively high percentages of graduates found continuing their education tended to have relatively low earnings for graduates found employed. For example, Black studies, women's studies, humanities, life sciences, speech pathology, and art history. In some cases, such as the life sciences and speech pathology, the expected or required level of education to practice in the field is at the graduate level. One could also speculate that graduates in some fields tend to continue their education because earnings for graduates at the baccalaureate level in their field are low.

Conversely, in fields with relatively high earnings, the rate of graduates continuing their education is low. For example computer science, health professions such as radiologic technology, nursing and occupational therapy, and some business programs such as risk management, management science and transportation management, had high average earnings (over $9,000 for the quarter) of graduates and low rates of continuing education (less than 15%). An exception to this trend appears in the engineering field where some programs with high earnings also had high rates of continuing education (25% or higher); i.e. electrical engineering, engineering science, industrial engineering, and mechanical engineering-related technologies.

Analysis by Industry Sectors

The next several sections examine the data by industry sectors in which the graduates were found employed, as well as detailed analysis of the relationship between industry sectors and majors. A matrix of the graduates by two-digit CIP category and industry sector is provided in the Appendices. Particular attention is paid to the high-tech industries and high-tech majors because of the growing interest in this arena.

While 21,680 of the 33,786 baccalaureate graduates with valid social security numbers were found employed in the state in the fourth quarter of 1999, the number of jobs held by these individuals was higher--28,939. Apparently a considerable number of individuals occupied more than one job or changed jobs during that period. It is possible that a significant number of new graduates maintained the employment they had during their college years, for example working in eating and drinking establishments, while searching for a new job after graduation, and made the transition during the fourth quarter of 1999.

Industries employing the largest number of graduates

The top 25 industries hiring SUS graduates of 1998-99, and the average full quarter earnings of those graduates appear in Table 9. Seven of the top 25 industries employing the graduates were also among the top 25 industries ranked by earnings of graduates, the highest average earnings being in the electric equipment industry sector ($10,742).

If one collapsed the industries into broader clusters, the industry cluster which hired the largest number of graduates was education services (17.27% of the employed graduates), followed closely by wholesale and retail trade (17.05%). Other industry clusters employing high percentages of graduates included business services (10.50% of employed graduates), health services (9.17% of the graduates employed) and engineering services (7.25% of the graduates

employed). The service industry plays a key role in Florida's economy and it is not surprising that over half the employed graduates were found in the service industries (54.5%). The service industry, which has an image of being a low-paying sector, does include some high- paying occupations such as those in engineering services.

Table 9: Highest Found Employed
Number of 1998-99 Graduates Found Employed in Florida
Compared To
Average 1999 Fourth-Quarter / Full-Quarter Earnings of 1998-99 Bachelor Graduates

Rank	Industry	# Employ	% of all Employ	FQ Earnings
1	Educational Services	4991	17.2%	$ 7,153
2	Business Services	3032	10.5%	$ 7,436
3	Health Services	2686	9.3%	$ 8,004
4	Engineering & Mgmt Services	2094	7.2%	$ 8,364
5	Eating and Drinking Places	1370	4.7%	$ 4,813
6	Non-Classifiable	901	3.1%	$ 7,986
7	Social Services	851	2.9%	$ 5,628
8	Executive, Legislative, Government	684	2.4%	$ 8,721
9	Misc. Retail	676	2.3%	$ 6,468
10	Amusement & Recreation Services	630	2.2%	$ 6,127
11	Wholesale Trade/Durable Goods	606	2.1%	$ 8,826
12	Communications	571	2.0%	$ 8,096
13	Banking	535	1.8%	$ 7,160
14	Admin of Human Resources	484	1.7%	$ 6,890
15	General Merchandise Stores	462	1.6%	$ 6,441
16	Apparel & Accessory Stores	446	1.5%	$ 5,746
17	Security Commodity Borkers	434	1.5%	$ 7,328
18	Wholesale Trade/Non-Durable Goods	423	1.5%	$ 8,313
19	Food Stores	416	1.4%	$ 6,400
20	Justice Public Order & Safety	396	1.4%	$ 6,962
21	Hotels & Lodging	390	1.3%	$ 6,104
22	Insurance Carriers	363	1.3%	$ 7,829
23	Insurance Agents and Services	348	1.2%	$ 8,280
24	Real Estate	343	1.2%	$ 6,972
25	Electric Equipment	333	1.2%	$ 10,742
	Total in Top Twenty-five	24465	84.5%	
	Graduates Employed by Industries	28939		

Only shows Average Earnings when minimum of three working Full Quarter

Source: FETPIP data files

Industries with highest earnings of graduates

The top 25 industries, paying the highest to graduates of the SUS are reflected in

Table 10: Highest Earnings

Average 1999 Fourth-Quarter / Full-Quarter Earnings of 1998-99 Bachelor Graduates Compared To Number of 1998-99 Graduates Found Employed in Florida

Rank	Industry	FQ Earnings	# Employ	% of all Employ
1	Paper & Allied Products	$ 18,575	11	0.0%
2	Machinery - Not Electrical	$ 11,292	135	0.5%
3	Transportation by Air	$ 10,750	120	0.4%
4	Electric Equipment	$ 10,742	333	1.2%
5	Instruments & Related Products	$ 10,560	95	0.3%
6	Electric Gas & Sanitary Services	$ 10,249	64	0.2%
7	Transportation Equipment	$ 10,147	57	0.2%
8	Non-Metallic Minerals, not Fuels	$ 10,136	10	0.0%
9	Local/Interurban Passenger Trains	$ 9,624	15	0.1%
10	Stone Clay & Glass Products	$ 9,576	49	0.2%
11	Chemicals & Allied Products	$ 9,480	47	0.2%
12	Building Contractors	$ 9,345	218	0.8%
13	Fabricated Metal Products	$ 9,105	23	0.1%
14	Heavy Construction Contractors	$ 8,983	69	0.2%
15	Rubber & Misc Plastic Products	$ 8,919	12	0.0%
16	Wholesale Trade/Durable Goods	$ 8,826	606	2.1%
17	Executive, Legislative, Government	$ 8,721	684	2.4%
18	Holding & Investments	$ 8,503	191	0.7%
19	Credit Agencies, Not Banks	$ 8,394	318	1.1%
20	Engineering & Mgmt Services	$ 8,364	2094	7.2%
21	Misc Manufacturing Industries	$ 8,321	15	0.1%
22	Wholesale Trade/Non-Durable Goods	$ 8,313	423	1.5%
23	Insurance Agents and Services	$ 8,280	348	1.2%
24	Auto Dealers/Service Stations	$ 8,151	143	0.5%
25	Communications	$ 8,096	571	2.0%
	Total in Top Twenty-five		6651	23.0%
	Graduates Employed by Industries		28939	

Only shows Average Earnings when minimum of three working Full Quarter

Source: FETPIP data files

Table 10. Transportation industries (air, train and transportation equipment) had high earnings. The well-paying industry sectors employing large numbers of graduates were engineering and management services (2094 graduates), executive, legislative, government (684 graduates) wholesale trade/durable goods (606 graduates), communications (571 graduates), wholesale trade, nondurable goods (423 graduates), Insurance agents and services (348 graduates) and electric equipment (333 graduates).

The view of average earnings of graduates by industry sector provides an incomplete picture, however, because earnings of graduates within each industry vary widely by their major in college. For example, mechanical engineering graduates in the engineering and management

services industry sector earned an average of $12,309 for the quarter, while criminal justice majors in the same industry sector earned a meager $5,577 on the average. In the executive, legal and government sector, with a modest overall average of $7,588, graduates majoring in public administration had impressively high average earnings of $12,454 for the quarter.

Industries with lowest earnings of graduates

The 25 lowest paying industries appear in Table 11. While the tourist industry accounts for a significant portion of the State's revenue, industry sectors related to tourism, such as museums/ galleries/gardens, eating and drinking places, hotels and lodging, amusement and recreation services, are among the lowest paying employers of SUS graduates. The agricultural

Table 11: Lowest Earnings of Graduates

Average 1999 Fourth-Quarter / Full-Quarter Earnings of 1998-99 Bachelor Graduates Compared To Number of 1998-99 Graduates Found Employed in Florida

Rank $	Industry	FQ Earnings	# Employ	% of all Employ
48	Justice Public Order & Safety	$ 6,962	396	1.4%
49	Admin of Human Resources	$ 6,890	484	1.7%
50	Water Transportation	$ 6,792	38	0.1%
51	Admin of Economic Programs	$ 6,782	101	0.3%
52	Legal Services	$ 6,741	286	1.0%
53	Personal Services	$ 6,707	123	0.4%
54	Building Materials / Garden Supplies	$ 6,686	116	0.4%
55	Misc Repair Services	$ 6,661	48	0.2%
56	Misc. Retail	$ 6,468	676	2.3%
57	General Merchandise Stores	$ 6,441	462	1.6%
58	Furniture & Fixtures	$ 6,412	8	0.0%
59	Food Stores	$ 6,400	416	1.4%
60	Environmental Quality & Housing	$ 6,131	97	0.3%
61	Amusement & Recreation Services	$ 6,127	630	2.2%
62	Hotels & Lodging	$ 6,104	390	1.3%
63	Motion Pictures	$ 6,039	125	0.4%
64	Membership Organizations	$ 5,859	250	0.9%
65	Apparel & Accessory Stores	$ 5,746	446	1.5%
66	Social Services	$ 5,628	851	2.9%
67	Apparel and Textiles	$ 5,411	9	0.0%
68	Ag Services	$ 5,341	145	0.5%
69	Ag Production/Livestock	$ 5,307	12	0.0%
70	Museums, Galleries, Gardens	$ 4,861	36	0.1%
71	Private Households	$ 4,815	23	0.1%
72	Eating and Drinking Places	$ 4,813	1370	4.7%
	Total in Lowest 25		7538	26.0%
	Graduates Employed		28939	

Only shows Average Earnings when minimum of three working Full Quarter

Source: FETPIP data files

sector, another important employer in Florida, and forestry, also had low earnings.

Majors hired by high-tech industry

Employees in high-tech industry account for only 7.3% of employees in the US and 5.35% of Florida's employees (Southern Growth Policies Board, 2001), but a great deal of attention is focused in enhancing this sector because it is believed that it has a significant impact on other industry sectors and the overall health of the economy. The industries considered by the US Department of Labor to be high-tech (as identified by staff of the Agency for Workforce Innovation in Florida) are listed below.

Chemicals and Allied Products
Electric and Electronic Equipment
Fabricated Metal Products
Instruments and Related Products
Communications
Engineering and Management Services
Business Services (selected industries within this sector)
Manufacturing Industries

In analyzing the graduates hired by these high-tech industries, one finds that, in addition to the obviously related disciplines in science, engineering and computer science, graduates of accounting, business administration and other business majors were hired in significant numbers. In engineering and management services, for example, the business graduates employed outnumbered the engineering graduates. In promoting high-tech industry within a state the data indicate that universities must supply these industries with graduates from a variety of majors, not just the high-tech majors. It is also evident that not all positions in high-tech industries pay well. As mentioned earlier, the earnings vary considerably by major, with engineering and computer science graduates having high earnings in all high-tech industries. Business administration and accounting graduates demonstrate high earnings in some of the high-tech industries, but only moderate earnings in others.

Industries employing high-tech majors

Just as high-tech industries employed from a wide range of majors, the high-tech majors were employed by an array of industries spanning electrical equipment, wholesale trade, business services, heavy construction, transportation, electric gas and sanitary services, communications, holding and investments, educational services, executive, legislative and general government to name a few.

Distribution of programs across industries

The proportion of graduates working in the industry sector most closely related to their degree program was examined. Only three disciplines at the two-digit level had at least half the graduates employed in the industry corresponding directly to the discipline: The education discipline with 65% of the employed graduates in educational services industries, architecture with 57% of the employed graduates in engineering services industries, and the health professions discipline with 53% of its employed graduates within the health services industries. While other industries also hired graduates of these disciplines, the majority of them were employed in the industry sector directly related to the major. All other disciplines had less than half of its graduates concentrated in any one industry sector. Some of these disciplines with concentrations in particular industries included engineering technology with 47% of the employed graduates in the construction industry, engineering with 24% in engineering services and 23% in manufacturing, and mathematics with 43% in education services and 19% in wholesale and retail trade.

At the six-digit CIP level, some industries hired graduates from a variety of programs, while others employed graduates whose majors were directly related to the industry. Some examples of industry hiring practices (arranged in alphabetical order by industry) are:

Table 12: Distribution of Programs Across Industries

Industry	Major/Discipline	% of Employed Graduates Found in Industry
Banking	Finance	32%
Banking	All Business Majors	61%
Business Services	All Business Majors	26%
Chemicals & Allied Prod	Sciences, Engineering, Ag	49%
Communications	Commun, Radio/TV, Advert/Mag Prod	26%
Education Services	Education	55%
Electronic & Equipment	Engineering/Eng Tech	60%
Engineering Management	Engineering/Eng Tech	17%
Engineering Management	Accounting	20%
Engineering Management	All Business Majors	38%
Fabricated Metals	Accounting	35%
General Building Contractors	Engineering/Eng Tech	50%
Hotel/Lodging	Hospitality Management	23%
Health Services	All Health Majors, Nutrition	59%
Insurance Agencies	Nursing	23%
Justice/Public Order/Safety	Criminal Justice Majors	52%
Motion Picture Industry	Commun, Film, Theatre	30%
Printing & Publishing	English, Journalism, Communications	28%
Security/Commodities	Finance	46%
Security/Commodities	All Business Majors	71%
Social Services	Psych, Social Work, Crim Just, Gerontol	51%
Transportation Equipment	Mechanical Engineering	30%
Transportation Equipment	Engineering/Eng Tech	60%

The distribution of graduates across industries illustrates two important points regarding baccalaureate programs: 1) Each discipline, and programs within the discipline, appear to prepare students to enter a wide array of industries and occupations; and 2) industries themselves are complex entities which draw from training in a number of fields. If incentives are provided for entry into certain programs and disincentives for entry into other programs, great caution must be exercised to prevent an unintended consequence of eroding the workforce for the very industry that the state wants to foster. This is particularly true of emerging high-tech trends within disciplines which are traditionally considered non-technological. For example, the arts are beginning to play a critical role in the high-tech digital media industry; while the engineering

and computer science programs provide the technical know-how, the industry looks to the arts, dramatic writing and humanities for the creative content.

Comparison of cohort of graduates to all employees by industry

Does the employment distribution of the cohort of graduates examined in this study mirror the distribution of all employees in the state captured in the FETPIP database? The simple answer is "no." As indicated in the bar graphs in the appendices, the greatest differences were found in educational services, where the graduates were found employed in much higher proportion than in the general population of all employees (17.25% compared to 5.99%), and wholesale and retail trade, where the converse was true (17.09% of the employed graduates compared to 26.38% of all employees). In addition to education services, the graduates also were found in greater proportions in the following industry clusters, compared to the distribution of all employees: finance, insurance and real estate; health services; social services; engineering services; public administration; and the "all other services" category. It appears that these are the industry clusters in which the baccalaureate graduates may have a disproportionate impact, at least in terms of numbers.

How do the average overall earnings (rather than the average full quarter earnings used in earlier analyses in this study) of the new baccalaureate graduates compare to the average earnings of all employees in the various industry clusters? One would expect the earnings of the new graduates to be significantly lower than the average in the industry since the latter is highly dependent on earnings of employees with longevity in the industry. While the average earnings of the new graduates generally were indeed lower than the industry average in most fields, the difference, with three exceptions, was not dramatic. The exceptions were legal services (overall average of $14,008 compared to average for the graduates of $5,477), finance, insurance and real

estate (with an overall average of $9,461 compared to $7,277 for the graduates) and public administration ($9,152 for the overall average compared to $7,277 for the graduates). Surprisingly, the new graduates, on the average, out-earned the average for all employees in four industry clusters: agriculture, forestry and fishing; construction; business services, and social services. The data are presented in the appendices.

Conclusion

Some of the findings of interest are summarized below:

➢The State University System of Florida generated 34,057 baccalaureate level graduates in 1998-99. 64% of these graduates were found employed in Florida in the fourth quarter of 1999, and 71% of the graduates were found either employed or continuing their education in the State.

➢A majority of out-of-state students, as well as in-state students, were found employed or continuing their education in Florida after graduation.

➢Graduates of professional programs in education, public administration, criminal justice, social work and business were found employed or continuing their education in the state at higher rates than graduates in most other degree programs.

➢Graduates of several engineering and science programs, on the other hand, demonstrated relatively low rates of employment or continuing their education in the State.

➢The list of programs producing the highest earnings was dominated by the engineering discipline. Other programs with high earnings included several in business, health, and information technology.

➢Five of the 25 top earning programs were also among the 25 top producers of graduates.

➢Except for education, architecture and health, where over 50% of the graduates employed were in the industry sector most closely related to the discipline, the graduates of other disciplines were distributed among a variety of different industries.

➢High-tech industries, in addition to hiring graduates from high-tech programs, employed considerable numbers of graduates from several different disciplines. Business graduates were among those hired in significant numbers by high-tech industries.

➢The average overall earnings of new baccalaureate graduates compare favorably to the average earnings of all employees in most industry sectors.

The study reflects initial earnings of recent graduates. Graduates in some majors may take longer to establish themselves in professions of their choice. Therefore programs may want to use this data along with surveys of feedback from recent graduates and employers to supplement the findings of the study.

The following recommendations emerge from the study:

►If the State is interested in increasing employees in high-paying high-tech fields, it must not only increase the production of graduates in the relevant programs but must also foster a critical mass of industries and attractive opportunities to keep the graduates in the State.

►The possibility of increasing high-earning opportunities for baccalaureate level science graduates should be explored. If the only well-paying opportunities for science graduates are at the graduate level, increasing those opportunities should also be explored.

►The State should examine the programs with very low earnings and determine if a combination of student career counseling and incentives to attract students into programs with better opportunities, and building better opportunities in the state for graduates in currently low-paying but important industries such as agriculture and film, should be explored.

► Increase the use of program outcomes data for career counseling of students from middle school through the university level.

► If the State wants more graduates in science and technology, then students in the elementary and secondary school systems should be further encouraged to enter scientific and technological fields. The interest and preparation to enter these fields must begin well before entry into the university.

► The State may also consider encouraging highly competitive out-of-state students to enter the science and engineering disciplines by reducing or waiving out-of-state tuition for such students. A recent study indicates that students tend to remain in the state from which they graduate, assuming attractive employment opportunities exist in the state, particularly if they attended college in a large state (Southern Growth Policies Board, 2001). 61% of the out-of-state students in Florida were found employed or continuing their education in the State following graduation.

► Examine curricular changes that could lead to better employment prospects for graduates of currently low-earning programs. Emerging examples already underway in the SUS include digital media opportunities for arts and creative/dramatic writing graduates.

► Because most industries hire from a wide range of programs, one must be cautious in discouraging students from entering programs which have no obvious connection to a targeted industry. Rather, one might examine how clusters of programs can better prepare graduates to meet the needs of clusters of industries.

► University-industry partnerships should be encouraged through various initiatives such as internship opportunities, joint research and joint-use facilities, so that faculty and industry representatives can establish productive relationships and graduates at both the bachelors and graduate levels, particularly in engineering and science fields, are more likely to remain in the

State. University-industry partnerships could also help faculty in low-paying majors assess how to better prepare their graduates for the workforce.

This study helped assess the extent to which the state universities are producing graduates to meet the state employment needs in high-tech and other targeted industries. The detailed information generated will help analyze programs that could be targeted for growth. The study also identified which industries are the largest employers of university system graduates, and how initial earnings of graduates compare among disciplines. The findings will assist future academic program planning and development of workforce strategies. The study could serve as a model for other states contemplating similar issues regarding the workforce.

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Appendices

State University System of Florida

1998-99 Baccalaureate Graduates

4th Qtr 1999 Employment (Florida Employment Data Only)

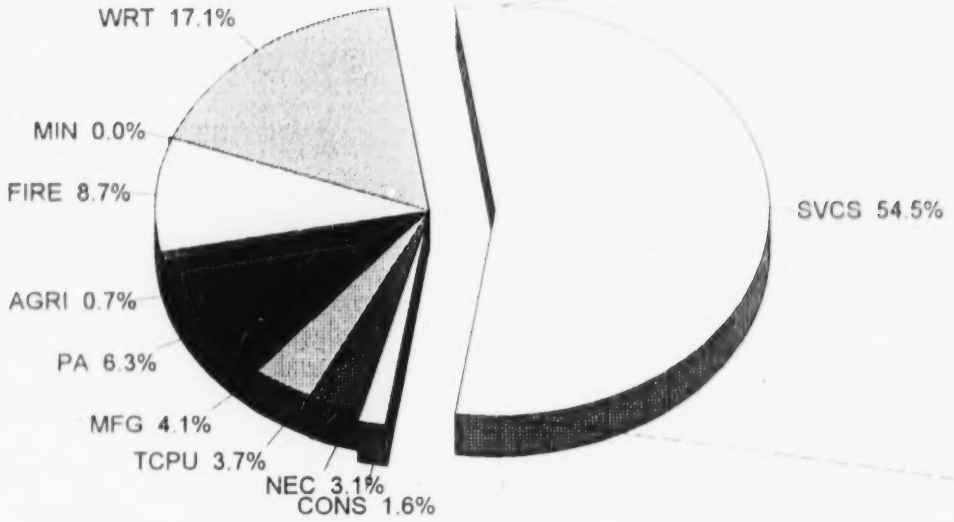
Major Discipline	Ciptitle	# Jobs	Agri., Forestry, Fishing	Mining	Constr	Manufact.	Trans., Comm., Elec,Gas & Sanitary Svcs	Whole-sale & Retail Trade	Finance, Ins. & Real Estate	SERVICES: Business Svcs	Health Svcs	Legal Svcs	Educ. Svcs	Social Svcs	Engin. Svcs	All Other Svcs	Public Admin.	Non-Classif. Estab.	Discipline % of All Emp
01	Agricultural Bus. & Prod	57	4	0	1	5	1	20	8	9	0	0	3	0	2	2	2	0	0.20%
02	Agricultural Sciences	252	35	0	2	8	3	69	9	29	24	1	26	2	11	13	14	6	0.87%
03	Renewable Natural Resources	199	6	1	7	9	5	31	4	11	4	2	25	2	29	19	37	7	0.69%
04	Architecture	136	5	0	6	0	1	13	2	7	0	3	9	0	77	6	5	2	0.47%
05	Area & Ethnic Studies	39	0	0	0	2	1	9	4	5	2	1	5	0	2	4	4	0	0.14%
09	Mass Communication	1,631	10	0	22	108	186	309	114	310	21	12	99	38	117	184	48	55	5.65%
11	Computer & Information Sci	605	0	0	7	82	41	70	58	179	10	1	42	3	45	11	31	25	2.10%
13	Education	4,177	8	0	19	21	37	495	83	150	124	7	2733	83	67	220	71	59	14.47%
14	Engineering	1,329	10	4	59	312	84	132	39	151	7	2	67	2	316	33	54	57	4.60%
15	Engineering Technology	242	0	0	114	17	10	8	11	16	3	0	5	0	40	2	5	11	0.84%
16	Foreign Languages	212	0	0	3	3	14	40	14	18	6	4	70	3	11	9	8	9	0.73%
19	Human Sciences	439	1	0	9	4	11	102	28	58	47	1	44	27	15	37	41	14	1.52%
22	Law	124	1	0	2	3	8	17	13	15	3	21	9	3	2	3	20	4	0.43%
23	Letters	1,029	7	0	10	56	41	230	85	156	32	22	178	26	42	83	39	22	3.56%
24	Liberal/General Studies	481	3	0	5	15	12	112	47	69	29	6	76	16	15	36	24	16	1.67%
25	Library & Archival Sciences	32	0	0	0	3	2	1	0	7	0	0	9	0	4	0	4	2	0.11%
26	Life Sciences	801	31	0	7	17	13	172	35	68	95	4	157	9	59	55	46	33	2.78%
27	Mathematics	126	0	0	0	3	1	24	10	7	4	0	54	1	5	7	4	6	0.44%
30	Multi/Interdisciplinary Study	141	3	0	2	1	2	30	7	15	24	0	21	6	8	10	8	4	0.49%
31	Parks, Rec., Leisure & Fitness	240	1	1	1	4	8	25	16	30	46	1	19	11	13	27	20	17	0.83%
38	Philosophy	83	0	0	1	1	5	22	5	11	7	2	12	2	4	7	4	0	0.29%
40	Physical Sciences	215	2	0	4	20	5	46	7	19	9	2	38	2	28	10	16	7	0.74%
42	Psychology	2,012	15	0	17	28	55	438	140	185	228	27	240	216	87	115	160	61	6.97%
43	Protective Services	1,359	5	0	17	14	33	268	105	127	34	46	75	64	31	64	441	35	4.71%
44	Public Administration & Svcs	777	5	0	6	6	19	62	32	47	138	6	72	145	17	20	186	16	2.69%
45	Social Sciences	2,315	6	2	30	65	95	517	210	250	90	56	330	84	114	171	224	71	8.02%
50	Visual & Performing Arts	723	8	0	9	45	18	187	29	108	12	4	114	7	68	84	13	19	2.50%
51	Health Professions & Rel. Sci	2,851	11	0	12	7	32	264	216	184	1511	8	220	60	65	97	89	75	9.88%
52	Business & Management	6,237	38	2	105	317	336	1209	1201	792	138	47	234	39	798	500	219	264	21.61%
		28,864	***213***	***10***	***477***	***1,174***	***1,079***	***4,922***	***2,532***	***3,031***	***2,648***	***286***	***4,986***	***851***	***2,092***	***1829***	***1,837***	***897***	
	Industry Share of All Jobs		**0.74%**	**0.03%**	**1.65%**	**4.07%**	**3.74%**	**17.05%**	**8.77%**	**10.50%**	**9.17%**	**0.99%**	**17.27%**	**2.95%**	**7.25%**	**6.34%**	**6.36%**	**3.11%**	**100%**

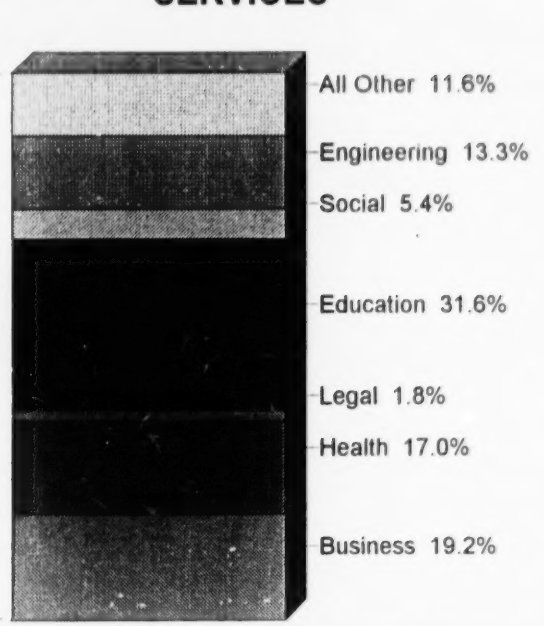
NOTE: Major degree programs aggregated into two digit Classification of Instructional Prg (CIP) codes. Listed titles are not specific degree names.

State University System of Florida

1998-99 Baccalaureate Graduates

4th Qtr 1999 Employment (Florida Employment Data Only)



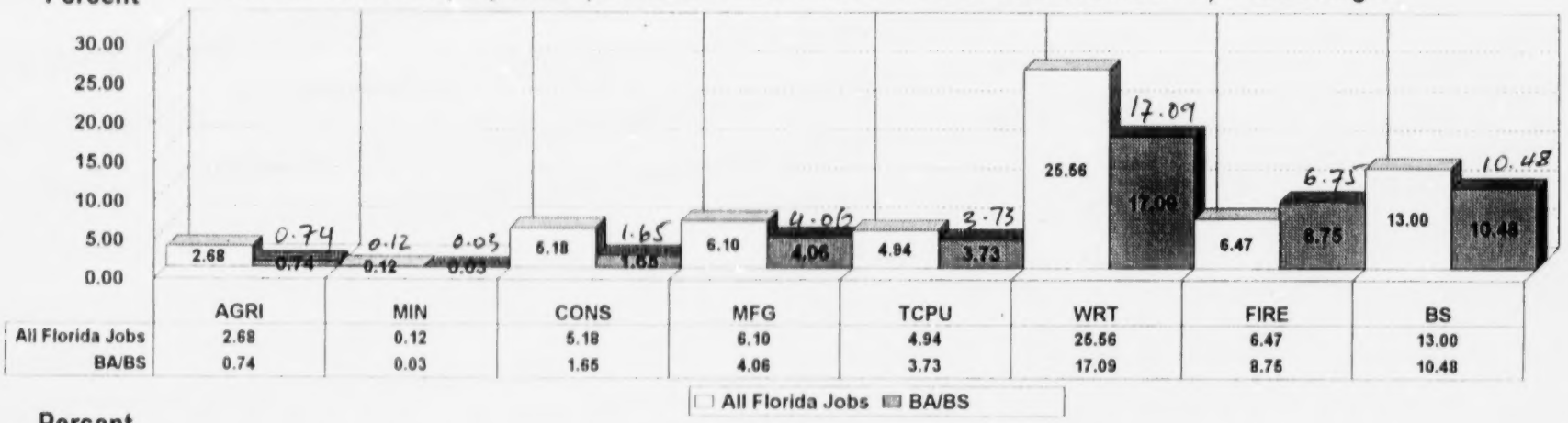


Note: These percentages represent a percentage of the total services.

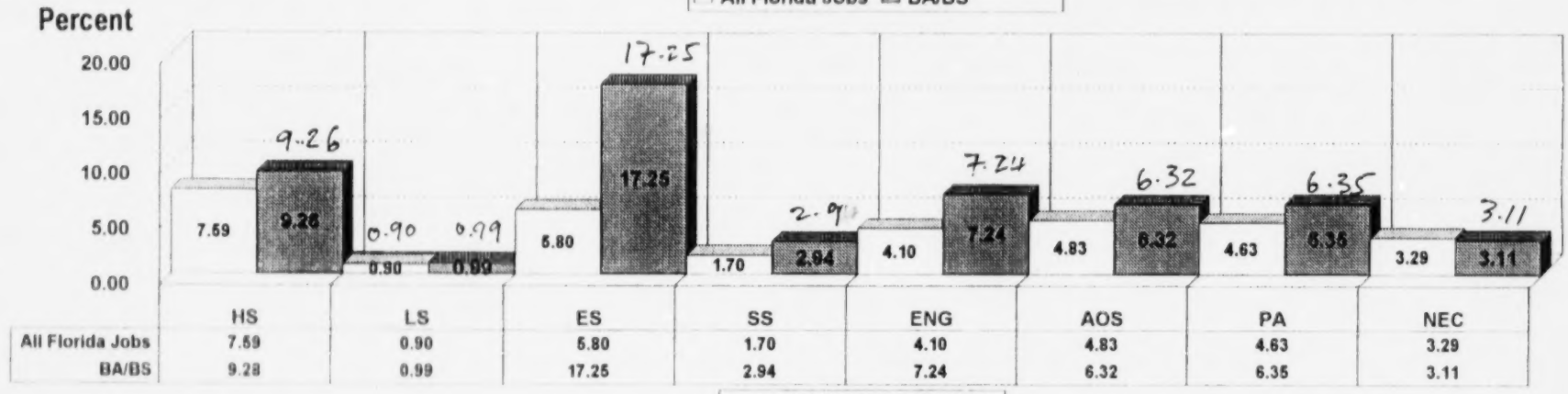
AGRI - Agriculture, Forestry & Fishing
CONS - Construction
FIRE - Finance, Ins. & Real Estate
MFG - Manufacturing
MIN - Mining
NEC - Non-Classified Estab.
PA - Public Administration
SVCS - Services
TCPU - Trans.,Comm.,Elec., Gas & Sanitary Services
WRT - Wholesale & Retail Trade

Florida Employment

4th Qtr 1999 Employment (All Florida Jobs vs Baccalaureate Graduates) Percentages



	AGRI	MIN	CONS	MFG	TCPU	WRT	FIRE	BS
All Florida Jobs	2.68	0.12	5.18	6.10	4.94	25.56	6.47	13.00
BA/BS	0.74	0.03	1.65	4.06	3.73	17.09	8.75	10.48

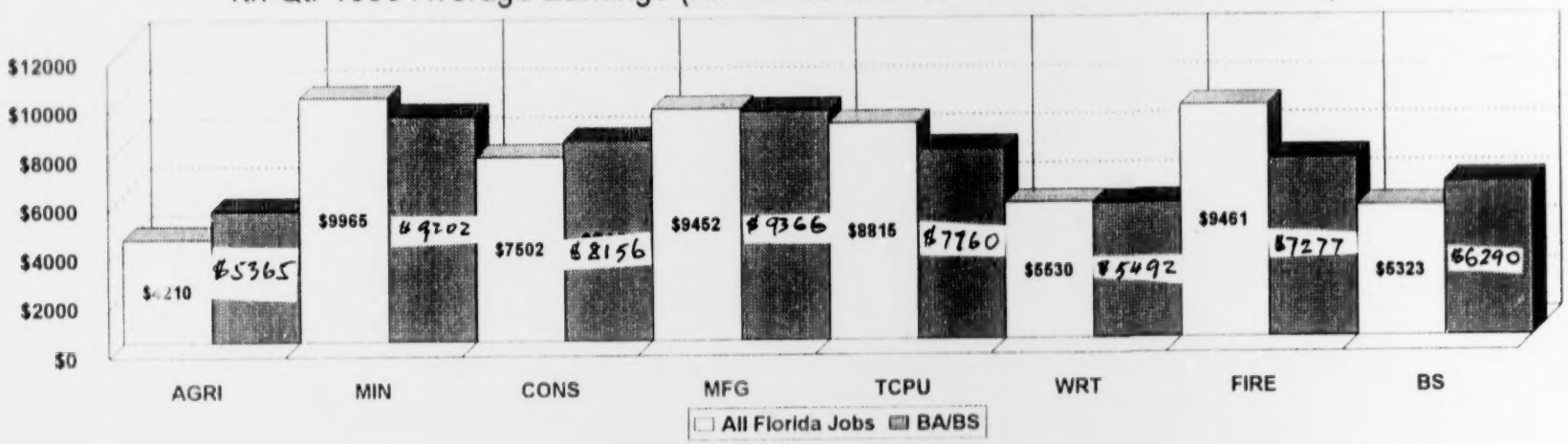


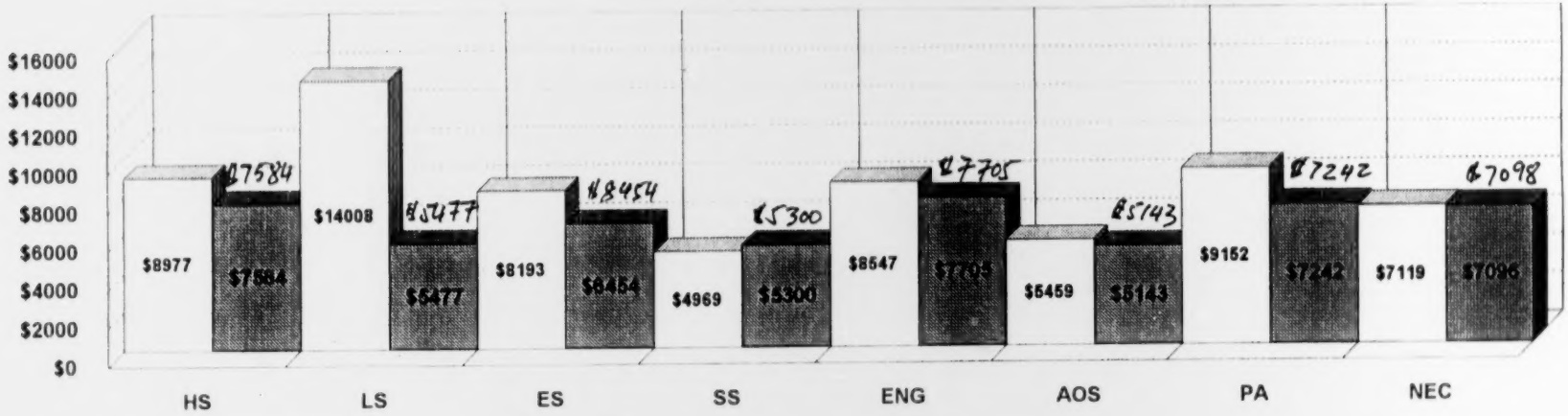
	HS	LS	ES	SS	ENG	AOS	PA	NEC
All Florida Jobs	7.59	0.90	5.80	1.70	4.10	4.83	4.63	3.29
BA/BS	9.28	0.99	17.25	2.94	7.24	6.32	6.35	3.11

AGRI - Agriculture, Forestry & Fishing
CONS - Construction
TCPU - Trans.,Comm.,Elec., Gas & Sanitary Services
FIRE - Finance, Ins. & Real Estate
HS - Health Services
ES - Education Services
ENG - Engineering Services
PA - Public Administration
MIN - Mining
MFG - Manufacturing
WRT - Wholesale & Retail Trade
BS - Business Services
LS - Legal Services
SS - Social Services
AOS - All Other Services
NEC - Non-Classified Estab.

Florida Employment

4th Qtr 1999 Average Earnings (All Florida Jobs vs Baccalaureate Graduates)





AGRI - Agriculture, Forestry & Fishing
CONS - Construction
TCPU - Trans.,Comm.,Elec., Gas & Sanitary Services
FIRE - Finance, Ins. & Real Estate
HS - Health Services
ES - Education Services
ENG - Engineering Services
PA - Public Administration

MIN - Mining
MFG - Manufacturing
WRT - Wholesale & Retail Trade
BS - Business Services
LS - Legal Services
SS - Social Services
AOS - All Other Services
NEC - Non-Classified Estab.

Average for All Florida Jobs: Per Job - $6126
Per Person - $7231
BA Average for all of Florida: Per Job - $5486
Per Person - $6873

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State University System of Florida

1998-99 BA/BS Graduates

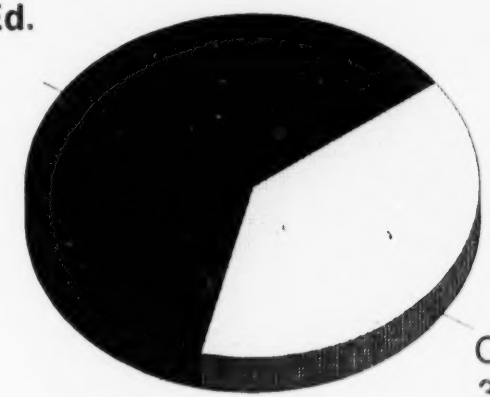
Found Rates for Florida Residents VS Out-of-State Residents

at Time of Initial University Registration

Found Employed or Continuing their Education in Florida

In-State Residents

Out-of-State Residents at Time of Registration

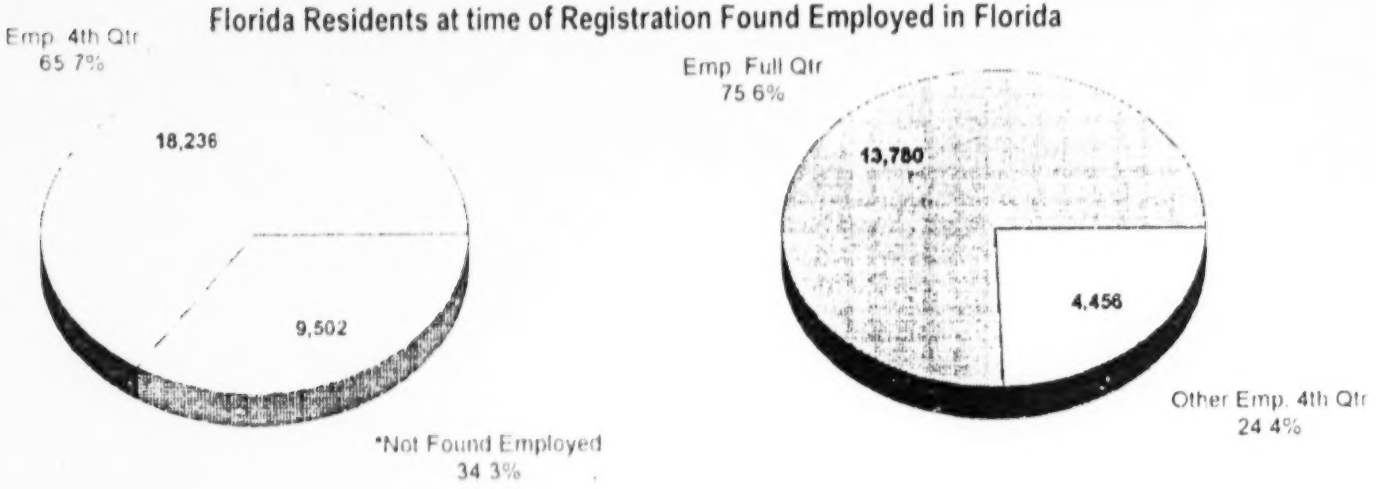


State University System of Florida

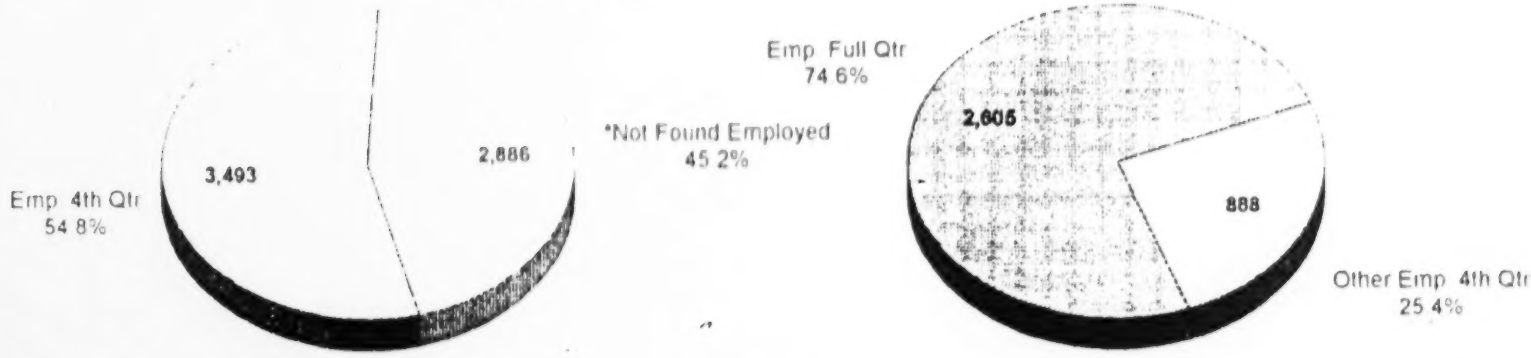
1998-99 BA/BS Graduates

Employment Following Graduation (4th Qtr 1999)

Florida Residents at time of Registration Found Employed in Florida



Out of State Residents at time of Registration Found Employed in Florida



*** Not found employed in Florida Employment**

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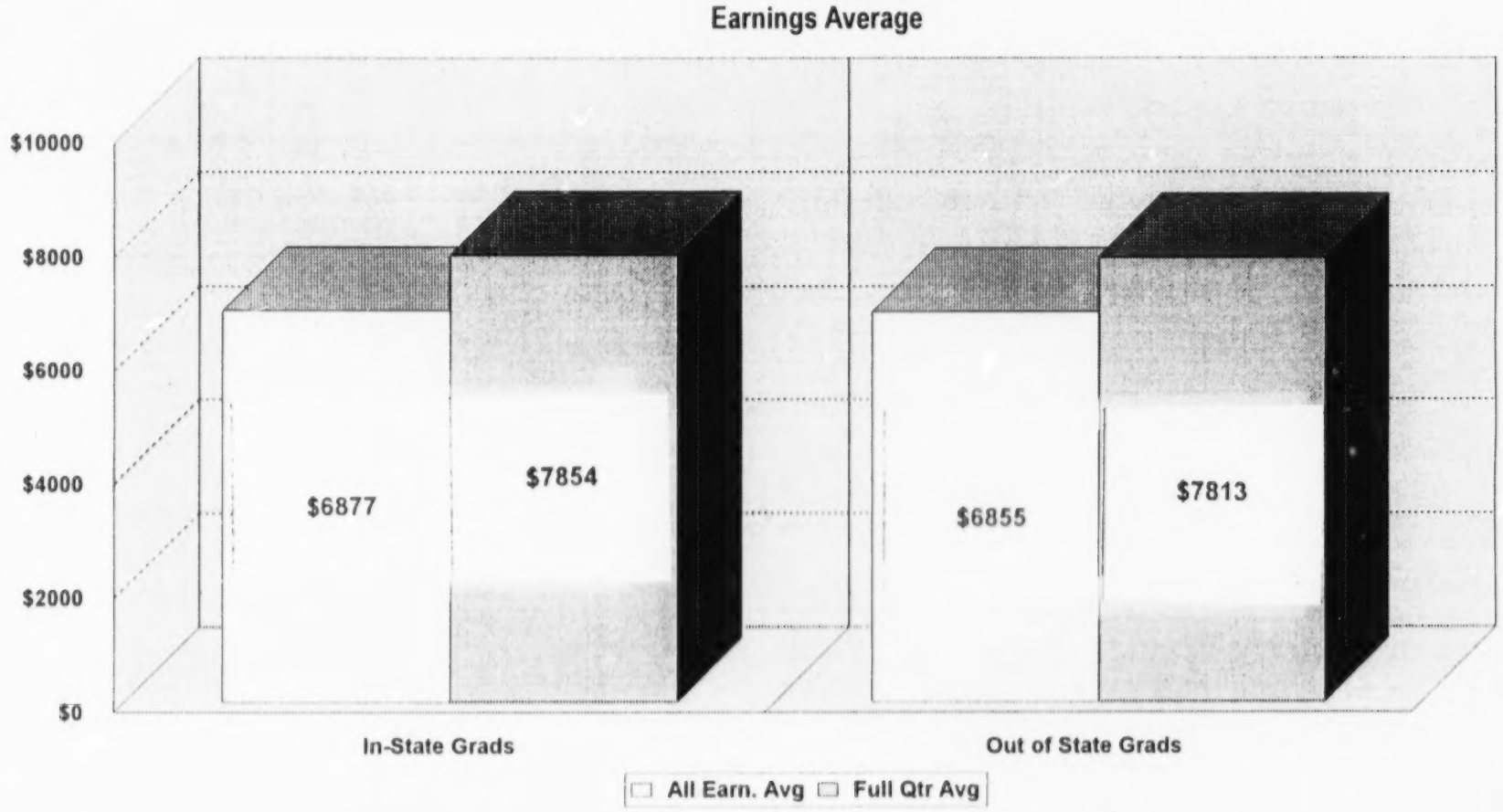
State University System of Florida

1998-99 BA/BS Graduates



Full Qtr = 13 Weeks X 40 Hours X $5.15 or minimum of $2,678 per Qtr

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Follow-up on 1998-99 SUS Baccalaureate Graduates for Fourth Quarter 1999

		# Grad	# All Empl	% Empl	# Cont Ed	% Cont Ed	# Cont Ed and Empl	% Cont Ed and Empl	# Cont Ed Not Empl	% Cont Ed Not Empl	Avg $ Includes Cont Ed	% Match
01.0102	Agricultural Business / Operations	11	6	55	3	27	1	9	2	18	$ 7,609	73
01.0103	Ag (Food and Resource) Economics	70	38	54	14	20	8	11	6	9	$ 7,259	63
01.0605	Landscape Operations & Mgmt	2	2	100	1	50	1	50	0	0	-	100
02.0101	Agriculture Science	11	5	45	0	0	0	0	0	0	$ 6,633	45
02.0201	Animal Science	100	58	58	40	40	19	19	21	21	$ 5,990	79
02.0301	Food Science & Technology	157	68	43	48	31	24	15	24	15	$ 6,011	61
02.0401	Plant Sciences	11	7	64	3	27	1	9	2	18	$ 8,030	82
02.0403	Horticulture Science	45	24	53	8	18	4	9	4	9	$ 6,567	62
02.0501	Soils Science	6	2	33	1	17	0	0	1	17	-	50
03.0102	Environmental Sci	154	94	61	34	22	19	12	15	10	$ 7,422	71
03.0501	Forest Resources & Conservation	108	62	57	22	20	13	12	9	8	$ 6,050	66
	TOTAL AG	675	366	54%	174	26%	90		84		Approx	67%
04.0201	Architecture	138	69	50	35	25	16	12	19	14	$ 8,639	64
04.0295	Design in Architecture	34	21	62	12	35	9	26	3	9	$ 8,103	71
04.0601	Landscape Architecture	22	11	50	1	5	0	0	1	5	$ 9,526	55
	TOTAL ARCHITECTURE	194	101	52%	48	25%	25		23		Approx	64%
05.0102	American Studies (USA)	6	3	50	2	33	1	17	1	17	$ 8,233	67
05.0103	Asian Studies	7	2	29	1	14	0	0	1	14	-	43
05.0107	Latin American Studies	6	4	67	1	17	1	17	0	0	$ 9,543	67
05.0201	African-American (Black) Studies	6	4	67	3	50	3	50	0	0	$ 5,130	67
05.0205	Jewish / Judaic Studies	3	-	0	0	0	0	0	0	0	-	0
05.0207	Women's Studies	19	13	68	6	32	3	16	3	16	$ 5,729	84
	TOTAL AREA STUDIES	47	26	55%	13	28%	8		5		Approx	66%
16.0101	Foreign Lang, Multiple	7	5	71	2	29	1	14	1	14	$ 5,477	86
16.0102	Linguistics	25	16	64	5	20	5	20	0	0	$ 6,411	64
16.0390	East Asian Lang/Literature	17	9	53	4	24	3	18	1	6	$ 4,125	59
16.0402	Russian	7	2	29	2	29	1	14	1	14	-	43
16.0501	German	26	13	50	12	46	6	23	6	23	$ 7,367	73
16.0901	French	46	18	39	16	35	6	13	10	22	$ 6,090	61
16.0902	Italian	4	3	75	2	50	2	50	0	0	-	75
16.0904	Portuguese	1	1	100	0	0	0	0	0	0	-	100
16.0905	Spanish	117	66	56	47	40	27	23	20	17	$ 6,896	74
16.1201	Classics	30	13	43	8	27	4	13	4	13	$ 4,877	57
16.1203	Latin	1	-	0	0	0	0	0	0	0	-	0
	TOTAL FOREIGN LANG	281	146	52%	98	35%	55		43		Approx	67%

Follow-up on 1998-99 SUS Baccalaureate Graduates for Fourth Quarter 1999

		# Grad	# All Empl	% Empl	# Cont Ed	% Cont Ed	# Cont Ed and Empl	% Cont Ed and Empl	# Cont Ed Not Empl	% Cont Ed Not Empl	Avg $ Includes Cont Ed	% Match
09.0101	Communication (Mass)	989	651	66	124	13	89	9	35	4	$ 6,804	70
09.0201	Advertising	303	192	63	30	10	20	7	10	3	$ 6,834	57
09.0401	Journalism	156	83	53	20	13	9	6	11	7	$ 6,585	61
09.0410	Magazine Production	35	18	51	5	14	2	6	3	9	$ 6,753	60
09.0501	Public Relations & Organizational Comm.	177	107	60	26	15	19	11	7	4	$ 6,626	65
09.0701	Radio & TV Broadcasting	260	167	64	26	10	13	5	13	5	$ 5,851	69
	TOTAL COMMUNICATIONS	1920	1218	63%	231	12%	152		79		Approx	68%
11.0101	Computer & Information Science	664	416	63	89	13	62	9	27	4	$ 10,722	68
11.0401	Information Sciences & Systems	132	94	71	14	11	12	9	2	2	$ 10,016	73
25.0101	Library / Information Studies	39	26	67	2	5	1	3	1	3	$ 7,697	69
52.1201	Mgmt Info Systems/Busi Data Proc.	83	48	58	1	1	0	0	1	1	$ 9,744	59
	TOTAL COMPUTER SCIENCES	918	584	64%	106	12%	75		31		Approx	67%
13.1001	Special Ed, General	339	225	66	94	28	56	17	38	11	$ 6,811	78
13.1005	Ed of the Emotionally Handicap	105	99	94	21	20	20	19	1	1	$ 8,366	95
13.1006	Ed of the Mentally Handicapped	48	39	81	11	23	9	19	2	4	$ 8,166	85
13.1009	Ed of Blind & Visually Handicapped	5	4	80	1	20	1	20	0	0	$ 9,672	80
13.1011	Ed of Specific Learning Disabled	167	139	83	33	20	31	19	2	1	$ 8,127	86
13.1202	Elementary Teacher Ed	2295	1731	75	350	15	260	11	90	4	$ 7,509	80
13.1203	Jr High/Middle School Ed	18	15	83	1	6	1	6	0	0	$ 5,965	83
13.1204	Pre-Elem/Early Childhood Teach Ed	121	73	60	10	8	3	2	7	6	$ 6,924	68
13.1205	Secondary Teacher Ed	51	32	63	10	20	6	12	4	8	$ 7,108	71
13.1301	Agricultural Teacher Ed (Voc)	22	15	68	8	36	4	18	4	18	$ 6,981	86
13.1302	Art Teacher Ed	37	29	78	4	11	3	8	1	3	$ 7,920	81
13.1303	Business Teacher Ed (Voc)	27	26	96	10	37	10	37	0	0	$ 8,130	96
13.1305	English Teacher Ed	158	126	80	20	13	14	9	6	4	$ 7,743	84
13.1306	Foreign Languages Teacher Ed	11	6	55	4	36	1	9	3	27	$ 7,716	82
13.1307	Health Teacher Ed	150	100	67	47	31	35	23	12	8	$ 6,727	75
13.1308	Home Economics Teacher Ed (Voc)	7	5	71	0	0	0	0	0	0	$ 5,707	71
13.1311	Mathematics Teacher Ed	114	77	68	15	13	10	9	5	4	$ 8,307	72
13.1312	Music Teacher Ed	92	52	57	12	13	8	9	4	4	$ 8,421	61
13.1314	Physical Ed Teaching & Coaching	523	326	62	109	21	76	15	33	6	$ 6,682	69
13.1316	Science Teacher Ed	57	43	75	5	9	4	7	1	2	$ 7,846	77
13.1317	Social Sciences Teacher Ed	137	97	71	21	15	15	11	6	4	$ 7,692	75
13.1320	Trade & Industrial Teacher Ed (Voc)	21	13	62	7	33	4	19	3	14	$ 9,647	76
13.1395	Secondary Science/Math Teach	8	4	50	1	13	0	0	1	13	$ 5,198	63
	TOTAL EDUCATION	4513	3276	73%	794	18%	571		223		Approx	78%

Follow-up on 1998-99 SUS Baccalaureate Graduates for Fourth Quarter 1999

		# Grad	# All Empl	% Empl	# Cont Ed	% Cont Ed	# Cont Ed and Empl	% Cont Ed and Empl	# Cont Ed Not Empl	% Cont Ed Not Empl	Avg $ Includes Cont Ed	% Match
14.0101	Engineering, General	1	-	0	0	0	0	0	0	0	-	0
14.0201	Aerospace Engineering	18	9	50	5	28	1	6	4	22	$ 8,548	78
14.0301	Agricultural Engineering	42	28	67	11	26	4	10	7	17	$ 8,369	83
14.0701	Chemical Engineering	162	58	36	30	19	16	10	14	9	$ 11,536	45
14.0801	Civil Engineering	352	237	67	83	24	43	12	40	11	$ 10,098	80
14.0901	Computer Engineering	294	183	62	54	18	32	11	22	7	$ 11,562	72
14.1001	Electrical, Electronics Eng	439	218	50	113	26	70	16	43	10	$ 11,151	62
14.1301	Engineering Science	24	12	50	12	50	5	21	7	29	$ 9,434	79
14.1401	Environmental Health Eng	97	55	57	25	26	11	11	14	14	$ 8,985	72
14.1701	Industrial/Manufacturing Eng	86	43	50	13	15	10	12	3	3	$ 10,362	55
14.1801	Materials Engineering (14.2001)	25	8	32	6	24	1	4	5	20	$ 9,612	52
14.1901	Mechanical Engineering	329	173	53	49	15	28	9	21	6	$ 11,510	60
14.2301	Nuclear Engineering	9	1	11	2	22	0	0	2	22	-	33
14.2401	Coastal & Ocean Eng	19	5	26	4	21	2	11	2	11	$ 9,056	47
14.2701	Industrial & Systems Eng	98	56	57	13	13	11	11	2	2	$ 10,348	60
15.0201	Civil Technology	4	1	25	0	0	0	0	0	0	-	25
15.0303	Electronic Engineering Tech	51	38	75	7	14	5	10	2	4	$ 10,730	78
15.0899	Mechanical Eng-Related Tech. (15.0202)	16	8	50	4	25	3	19	1	6	$ 11,708	56
15.1001	Construction/Build Tech (15.0103/15.0104)	192	146	76	13	7	9	5	4	2	$ 10,631	78
15.1101	Engineering Tech, General	17	9	53	3	18	3	18	0	0	$ 11,770	53
15.1102	Surveying	17	13	76	2	12	1	6	1	6	$ 11,865	82
	TOTAL ENGINEER & ENG TECH	2292	1301	57%	449	20%	255		194		Approx	65%
19.0101	Home Economics, General	2	1	50	0	0	0	0	0	0	-	50
19.0301	Family and Community Studies	72	47	65	3	4	3	4	0	0	$ 6,613	65
19.0503	Dietetics/Nutritional Services	195	110	56	47	24	26	13	21	11	$ 6,244	68
19.0701	Home & Family Life	132	97	73	29	22	23	17	6	5	$ 5,716	78
19.0901	Textiles & Clothing	78	46	59	4	5	1	1	3	4	$ 7,433	63
	TOTAL HUMAN SCIENCES	479	301	63%	83	17%	53		30		Approx	69%
22.0103	Legal Assisting	154	92	60	23	15	12	8	11	7	$ 6,213	68
	TOTAL LEGAL STUDIES	154	92	60%	23	15%	12		11		Approx	68%
23.0101	English, General	1023	569	56	241	24	140	14	101	10	$ 6,643	66
23.1001	Rhetorical Speech & Commun	284	193	68	31	11	25	9	6	2	$ 6,584	71
	TOTAL LETTERS	1307	762	58%	272	21%	165		107		Approx	66%
24.0101	Liberal Arts & Studies	411	275	67	80	19	48	12	32	8	$ 7,317	75
24.0102	Independent Studies	7	5	71	1	14	1	14	0	0	$ 8,231	71
24.0103	Humanities	81	50	62	20	25	12	15	8	10	$ 5,331	74
24.0104	New College / Honors College	137	40	29	18	13	4	3	14	10	$ 5,598	39
30.9901	Indepndnt/Interdisc Studies	67	21	31	22	33	5	7	17	25	$ 7,070	57
	TOTAL LIBERAL ARTS	703	391	56%	141	20%	70		71		Approx	66%
26.0101	Biology, General	726	352	48	164	23	93	13	71	10	$ 6,372	58

Follow-up on 1998-99 SUS Baccalaureate Graduates for Fourth Quarter 1999

		# Grad	# All Empl	% Empl	# Cont Ed	% Cont Ed	# Cont Ed and Empl	% Cont Ed and Empl	# Cont Ed Not Empl	% Cont Ed Not Empl	Avg $ Includes Cont Ed	% Match
26.0202	Biochemistry	21	8	38	10	48	4	19	6	29	$ 6,942	67
26.0301	Botany, General	15	9	60	2	13	1	7	1	7	$ 8,037	67
26.0501	Microbiology /Bacteriology	269	114	42	91	34	28	10	63	23	$ 6,141	66
26.0603	Interdisciplinary Ecology	1	1	100	0	0	0	0	0	0	-	100
26.0607	Marine/Aquatic Biology	16	7	44	7	44	2	13	5	31	$ 4,719	75
26.0701	Zoology	96	42	44	34	35	10	10	24	25	$ 5,972	69
26.0702	Entomology	22	10	45	6	27	4	18	2	9	$ 5,941	55
30.0101	Interdisc. Biological & Physical Sci	99	47	47	26	26	11	11	15	15	$ 6,820	64
	TOTAL LIFE SCIENCES	1265	590	47%	340	27%	153		187		Approx	61%
40.0201	Astronomy	1	-	0	1	100	0	0	1	100	-	100
40.0401	Atmospheric Sci & Meteorology	21	9	43	1	5	1	5	0	0	$ 7,729	43
40.0501	Chemistry	185	93	50	47	25	23	12	24	13	$ 7,248	63
40.0508	Chemical Sciences	11	3	27	2	18	1	9	1	9	$ 4,881	45
40.0601	Geology	52	27	52	18	35	8	15	10	19	$ 8,390	73
40.0801	Physics	47	17	36	18	38	5	11	13	28	$ 7,462	64
	TOTAL PHYSICAL SCIENCES	317	149	47%	87	27%	38		49		Approx	62%
27.0101	Mathematics, General	175	88	50	48	27	24	14	24	14	$ 7,517	65
27.0301	Applied Math/Math Sciences	1	1	100	0	0	0	0	0	0	-	100
27.0501	Statistics	11	4	36	2	18	0	0	2	18	$ 6,919	55
	TOTAL MATH	187	93	50%	50	27%	24		26		Approx	64%
31.0301	Recreation, Leisure Services	230	160	70	24	10	16	7	8	3	$ 6,656	74
31.0505	Exercise Sci/Physiol/Mvmnt Studies	38	24	63	9	24	8	21	1	3	$ 6,152	66
	TOTAL LEISURE SERVICES	268	184	69%	33	12%	24		9		Approx	72%
38.0101	Philosophy	83	34	41	23	28	12	14	11	13	$ 5,712	54
38.0201	Religious Studies	46	27	59	11	24	6	13	5	11	$ 6,463	70
38.0310	Philosophy & Religion	4	-	0	1	25	0	0	1	25	-	25
	TOTAL PHIL/ RELIGION	133	61	46%	35	26%	18		17		Approx	59%
42.0101	Psychology, General	2190	1364	62	572	26	376	17	196	9	$ 6,199	72
42.1101	Psychobiology / Complex Systems	6	2	33	1	17	1	17	0	0	-	33
42.1601	Social Psychology	27	21	78	6	22	5	19	1	4	$ 7,156	81
	TOTAL PSYCHOLOGY	2223	1387	62%	579	26%	382		197		Approx	71%

Follow-up on 1998-99 SUS Baccalaureate Graduates for Fourth Quarter 1999

		# Grad	# All Empl	% Empl	# Cont Ed	% Cont Ed	# Cont Ed and Empl	% Cont Ed and Empl	# Cont Ed Not Empl	% Cont Ed Not Empl	Avg $ Includes Cont Ed	% Match
43.0104	Criminal Justice Studies	1399	984	70	307	22	220	16	87	6	$ 7,226	78
43.0106	Forensic Science	11	8	73	2	18	2	18	0	0	$ 6,475	73
44.0401	Public Administration	103	80	78	34	33	27	26	7	7	$ 9,760	86
44.0701	Social Work, General	587	422	72	240	41	164	28	76	13	$ 6,702	85
44.0705	Human Services	10	9	90	2	20	2	20	0	0	$ 6,669	90
30.1101	Gerontology	37	27	73	11	30	9	24	2	5	$ 7,077	78
	TOTAL SOCIAL SERVICES	2147	1530	71%	596	28%	424		172		Approx	79%
45.0101	Social Sciences, General	418	281	67	109	26	72	17	37	9	$ 6,995	77
45.0201	Anthropology	193	97	50	46	24	24	12	22	11	$ 5,450	63
45.0601	Economics	242	122	50	45	19	24	10	21	9	$ 7,764	60
45.0701	Geography	92	53	58	14	15	6	7	8	9	$ 6,886	66
45.0801	History	480	273	57	123	26	78	16	45	9	$ 6,731	67
45.0901	International Relations	253	140	55	63	25	38	15	25	10	$ 6,748	66
45.1001	Political Science & Government	749	396	53	183	24	109	15	74	10	$ 7,478	63
45.1101	Sociology	477	313	66	100	21	71	15	29	6	$ 6,976	72
	TOTAL SOCIAL SCIENCES	2904	1675	58%	683	24%	422		261		Approx	67%
50.0301	Dance	41	21	51	4	10	2	5	2	5	$ 6,197	56
50.0402	Graphic Design	49	20	41	0	0	0	0	0	0	$ 6,811	41
50.0408	Interior Design	96	61	64	5	5	1	1	4	4	$ 7,700	68
50.0501	Dramatic Arts	195	92	47	15	8	8	4	7	4	$ 5,803	51
50.0601	Film and Motion Picture	26	9	35	1	4	0	0	1	4	$ 5,442	38
50.0602	Motion Picture and TV Tech	27	15	56	0	0	0	0	0	0	$ 4,919	56
50.0701	Visual Art, General	215	139	65	35	16	23	11	12	6	$ 6,589	70
50.0702	Studio/Fine Art	223	117	52	31	14	18	8	13	6	$ 6,144	58
50.0703	Art History & Appreciation	33	18	55	13	39	9	27	4	12	$ 4,830	67
50.0801	Graphics Arts Technology	3	3	100	0	0	0	0	0	0	-	100
50.0901	Music, General	73	22	30	25	34	6	8	19	26	$ 6,605	56
50.0903	Music Performance	59	21	36	15	25	6	10	9	15	$ 7,326	51
50.0904	Music Composition	2	2	100	2	100	2	100	0	0	-	100
50.0913	Jazz Studies	7	3	43	1	14	0	0	1	14	$ 9,254	57
	TOTAL PERFORMING ARTS	1049	543	52%	147	14%	75		72		Approx	59%

Follow-up on 1998-99 SUS Baccalaureate Graduates for Fourth Quarter 1999

		# Grad	# All Empl	% Empl	# Cont Ed	% Cont Ed	# Cont Ed and Empl	% Cont Ed and Empl	# Cont Ed Not Empl	% Cont Ed Not Empl	Avg $ Includes Cont Ed	% Match
51.0204	Speech Pathology and Audiology	454	271	60	184	41	111	24	73	16	$ 5,850	76
51.0701	Health Services Admin	300	223	74	60	20	45	15	15	5	$ 7,537	79
51.0706	Health Information Management	88	70	80	10	11	6	7	4	5	$ 7,445	85
51.0907	Radiologic (Med) Tech	17	13	76	1	6	0	0	1	6	$ 9,288	82
51.0908	Cardiopulmonary Sciences (RespTher	69	53	77	19	28	17	25	2	3	$ 8,317	80
51.1005	Medical Technology	63	55	87	4	6	4	6	0	0	$ 8,806	87
51.1601	Nursing	1126	906	80	181	16	155	14	26	2	$ 9,954	84
51.2305	Music Therapy	8	6	75	1	13	1	13	0	0	$ 6,069	75
51.2306	Occupational Therapy	143	88	62	15	10	11	8	4	3	$ 8,903	66
51.2308	Physical Therapy	213	135	63	21	10	16	8	5	2	$ 8,020	66
51.2310	Vocational Rehab Counseling	32	22	69	6	19	3	9	3	9	$ 5,648	78
51.2795	Health Science	254	186	73	80	31	56	22	24	9	$ 7,368	83
	TOTAL HEALTH	2767	2028	73%	582	21%	425		157		Approx	79%
52.0101	Business, General	367	283	77	46	13	37	10	9	2	$ 8,043	80
52.0201	Busi Admin & Mgmt	1783	1184	66	189	11	132	7	57	3	$ 8,871	70
52.0301	Accounting	1338	950	71	475	36	345	26	130	10	$ 8,602	81
52.0601	Business Managerial Economics	63	37	59	10	16	6	10	4	6	$ 6,914	65
52.0801	Finance, General	1628	1046	64	185	11	120	7	65	4	$ 8,097	69
52.0803	Financial Services	12	10	83	1	8	1	8	0	0	$ 6,561	83
52.0805	Insurance & Risk Mgmt	21	17	81	1	5	1	5	0	0	$ 9,634	81
52.0901	Hospitality Admin/Mgmt	366	214	58	26	7	16	4	10	3	$ 6,646	61
52.1001	Human Resources Management	12	10	83	1	8	1	8	0	0	$ 7,780	83
52.1101	International Busi. Mgmt	239	138	58	30	13	20	8	10	4	$ 7,742	62
52.1301	Management Science	428	271	63	43	10	27	6	16	4	$ 10,129	67
52.1401	Marketing Mgmt	1002	677	68	100	10	73	7	27	3	$ 8,006	70
52.1501	Real Estate	43	28	65	6	14	3	7	3	7	$ 6,505	72
52.9995	Transportation Management	12	11	92	0	0	0	0	0	0	$ 10,244	92
	TOTAL BUSINESS	7314	4876	67%	1113	15%	782		331		Approx	71%
	Total Bachelor Grads: No minimums	34057	21680	64%	6677	20%	4298		2379		Aapprox	71%

Source: FETPIP Followup of 1998-99 Graduates for Last Quarter 1999

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